Cal Black Memorial Airport

DRAFT
Supplemental Environmental Impact Statement and Section 4(f) Evaluation

DEPARTMENT OF TRANSPORTATION, FEDERAL AVIATION ADMINISTRATION has prepared an Draft Supplemental Environmental Impact Statement for the Replacement Airport at Halls Crossing Final Environmental Impact Statement in Halls Crossing, Utah.

Lead Agency – Federal Aviation Administration (FAA)
Cooperating Agencies – Bureau of Land Management (BLM) & National Park Service (NPS)

The FAA presents this Draft Supplemental Environmental Impact Statement for review pursuant to the following public law requirements, including Section 102(2) (C) of the National Environmental Policy Act of 1969 (P.L. 91-190); the Federal Aviation Act of 1958 recodified at 49 U.S.C. Section 40101 et seq; the Airport and Airway Improvement Act of 1982, as amended recodified at 49 U.S.C. Section 47101 et seq; Section 4(f) of the Department of Transportation Act of 1966 recodified at Section 303c, as amended; National Historic Preservation Act of 1966, as amended; and other laws as applicable.

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Executive Summary

In May 1990, the Federal Aviation Administration (FAA), in cooperation with the National Park Service (NPS) and the Bureau of Land Management (BLM), issued the *Replacement Airport at Halls Crossing Final Environmental Impact Statement* (1990 Final EIS) for the development of a replacement airport for Halls Crossing Airport, which was located within the boundary of the Glen Canyon National Recreation Area (GCNRA). A Record of Decision was issued in August 1990 approving the development of what is now named the Cal Black Memorial Airport. Concurrently, the BLM approved an amendment of a land plan which allowed the conveyance of land to San Juan County for the construction of the new airport. In reaching its approval, the FAA determined that there would be a Department of Transportation (DOT) Section 4(f) (herein referred to as Section 4(f)) impact but that the impact did not represent a constructive use of Section 4(f) resources. The 1990 Final EIS noted that the new airport's effects would not be significant and would not impair the recreational experience of visitors to the GCNRA as a result of the new airport.

In 1990, the National Parks Conservation Association (NPCA)[1], et al.[2] brought suit concerning the adequacy of the 1990 Final EIS and the adequacy of the BLM plan amendment and land transfer process. In its July 7, 1993 decision, the U.S. Court of Appeals for the Tenth Circuit concluded that "the action of FAA approving the project based on a finding of 'no significant impact' and 'no significant adverse impact' [was] arbitrary and capricious." The court proceeding stated:

> "We therefore REVERSE the BLM's plan amendment and the transfer of land. We REMAND for further proceedings to determine whether the land should be retained under BLM control and management or reconveyed to San Juan County under a newly proposed land use plan amendment. In the case of the FAA, the airport has already been built. This does not mean that a remand would be meaningless, however. On remand, the FAA should re-analyze the impact of the airport under section 4(f) and section 2208.[3] The FAA may determine that it must make use of studies not utilized in the current FEIS. If a "significant" impact is found, section 4(f) and section 2208 require that all reasonable steps be taken to mitigate the damage or adverse impact. We therefore REVERSE the FAA's determination of no significant impact and REMAND to the FAA for further proceedings consistent with this decision."

In response to the court decision, on February 7, 2001, the FAA issued a Draft Supplemental EIS for public and agency review and comment. A Final Supplemental EIS was not issued. This Draft Supplemental EIS is a replacement for the 2001 Draft Supplemental EIS because of the passage of time, completions of actions of the BLM, and changes in FAA guidance. This new document is reliant in part on the methodologies specified in FAA's 2007 *Guidance on Procedures for Evaluating the Potential Noise Impacts of Airport Improvement Projects on National Parks and Other Sensitive Park Environments* (Guidance for Park-Related Supplemental Noise Studies).

This Draft Supplemental EIS addresses: (1) the measurement of actual aircraft noise levels; (2) an updated evaluation of existing and future aircraft noise levels using the FAA's 2007 Guidance for Park-Related Supplemental Noise Studies; (3) a Section 4(f) evaluation using the updated analysis; and (4) an analysis on potential cumulative effects. The BLM conducted their own environmental analysis for the plan amendment and transfer of land in the 2008 BLM Monticello Field Office Resource Management Plan.

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1 Note: The title of the organization as documented in the 1993 United States Court of Appeals case *National Parks Conservation Association, et al. v Federal Aviation Administration, et al.*

2 Other parties to the suit included the Southern Utah Wilderness Alliance, the Sierra Club, and Deborah L. Threedy.

3 Note: In 1994, the provisions of the Airport and Airway Improvement Act of 1982 were codified in U.S. Code Title 49, chapter 471, subchapter I.

Based upon the new analysis of aircraft noise exposure, the FAA reaffirms its conclusions that the construction of the replacement airport has not resulted in substantial increases in noise within GCNRA, and has not negatively affected visitor experiences in the park. On October 9, 2014 the US Department of the Interior, National Park Service concurred with these findings, and on October 24, 2014 the Bureau of Land Management concurred with these findings (**Appendix D**, *Agency Coordination*). The revised analysis continues to show that the closure of the airport within GCNRA and the replacement airport at Cal Black Memorial Airport on land outside the park has reduced the overall aircraft noise level exposure to GCNRA, even though small parts of the park now experience higher aircraft noise. Furthermore, the replacement of Halls Crossing Airport at Cal Black Memorial Airport has not resulted in the use of resources protected under Section 4(f) and has not had any significant impacts. Thus, significant impacts to the visitor experience were not identified. (Note: through its 2008 Resource Management Plan,[4] the BLM addressed its requirements).

[4] Bureau of Land Management Monticello Field Office, *Record of Decision and Approved Resource Management Plan* (November 2008).

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I. INTRODUCTION, BACKGROUND, AND ACTIVITY FORECAST

The Federal Aviation Administration (FAA), in cooperation with the Bureau of Land Management (BLM) and the National Park Service (NPS), has prepared this Draft Supplemental Environmental Impact Statement (herein referred to as Draft Supplemental EIS) pursuant to the requirements of the National Environmental Policy Act of 1969 (NEPA), and in accordance with Title V of Public Law 97-248 of the Airport and Airway Improvement Act of 1982, as amended, as well as the FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, and FAA Order 1050.1E (Change 1), *Environmental Impacts: Policies and Procedures*. It has been prepared in response to the July 7, 1993 decision of the United States Court of Appeals for the Tenth Circuit in *National Parks Conservation Association*[5]*, et al.*[6] *v Federal Aviation Administration, et al*[7] (see **Appendix A,** 1993 Court of Appeals Case: *National Parks Conservation Association, et al. v Federal Aviation Administration, et al*.

1.1 Background

Before the construction of Cal Black Memorial Airport, Halls Crossing and Bullfrog Basin Airports served all general aviation users visiting the Halls Crossing and Bullfrog Marinas on Lake Powell in Utah. Both airports had terrain obstructions and site limitations, and, therefore, both airports were constrained for future improvements to meet FAA airport design standards and operational capability. By 1990, a proposed replacement airport for Halls Crossing Airport had been under consideration by the FAA, San Juan County, and NPS for over 20 years.[8] As a result of inadequate existing aviation facilities, and to address a need for a replacement airport to meet public demand for aircraft users in the Halls Crossing area, and to meet FAA airport design standards, a replacement airport was proposed and an *Environmental Impact Statement for a Replacement Airport at Halls Crossing, San Juan County, Utah* was released in 1990 (herein referred to as the 1990 Final EIS) to consider the environmental impacts that would result from the proposed replacement airport.

The 1990 Final EIS for the Replacement Airport at Halls Crossing (that led to the creation of Cal Black Memorial Airport) explained that the purpose of the project was to accommodate existing and forecast growth and to meet FAA design criteria. Implementation of the project would address the following needs: meeting FAA design criteria, providing safe air transportation access in the area, and correcting deficiencies including approach surface obstructions, inadequate runway length, width, and safety areas, and excessive runway gradient. The 1990 Final EIS estimated that with the new airport, a doubling of operations could occur by 1998, and thus a doubling of overflights would occur over affected regions of the Glen Canyon National Recreational Area (GCNRA).

In evaluating the potential impact of increased noise on recreational use, the 1990 Final EIS discussed that noise impacts are subjective, as a recipient's attitude and sensitivity factor into the determination of the level of impact. In the backcountry, it was estimated by the 1990 Final EIS that there were about 8-20 minutes per day of audible overflight by general aviation aircraft using Bullfrog Basin and Halls Crossing Airports (as compared to several hours per day at 45-55 dBA by enroute jet aircraft and occasional very high noise levels from military overflights). The FAA concluded that doubling of operations could lead to

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5 Note: The title of the organization as documented in the 1993 United States Court of Appeals case *National Parks Conservation Association, et al. v Federal Aviation Administration, et al.*

6 Other parties to the suit included the Southern Utah Wilderness Alliance, the Sierra Club, and Deborah L. Threedy.

7 *National Parks Conservation Association, et al. v Federal Aviation Administration, et al*., 998 F.2d 1523 (10th Cir 1993).

8 U.S. Department of Transportation, Federal Aviation Administration, *Replacement Airport at Halls Crossing Final Environmental Impact Statement, San Juan County, Utah* (Washington, DC, May 1990), viii.

doubling of exposure (to 16-40 minutes per day). While the 1990 Final EIS acknowledged this impact, the FAA concluded that the new airport would not result in significant adverse impacts to the recreational experience of visitors.[9] Additionally, with regard to Department of Transportation (DOT) Section 4(f) of the Transportation Act (herein referred to as Section 4(f)), FAA concluded that there was no feasible and prudent alternative for the use of the land as no other feasible and prudent site was available for the new airport, and that all possible planning had been exercised to minimize harm resulting from the project (see **Appendix A,** 1993 Court of Appeals Case: *National Parks Conservation Association, et al. v Federal Aviation Administration, et al*).[10] In August 1990, the FAA issued a Record of Decision approving the development of Cal Black Memorial Airport.

In July 1990, the National Parks Conservation Association, et al. brought suit against the FAA and the BLM over the adequacy of the 1990 Final EIS and the associated land transfer. Below are key points raised in the court case regarding the 1990 Final EIS: [11]

- "Petitioners… assert that the actions of the FAA violate section 4(f) of the Transportation Act and section 2208 of AAIA [Airport and Airways Improvement Act]."
- "The FAA provided no empirical evidence to support this claim [of no significant impact on recreational use], which appears to contradict other findings in the FEIS."
- "The FAA explicitly rejected the Ldn[12] methodology and performed the noise impact analysis based on various assumptions and subjective values…"

The court concluded that "the action of FAA approving the project based on a finding of 'no significant impact' and 'no significant adverse impact' [was] arbitrary and capricious". The court stated "We therefore REVERSE the BLM's plan amendment and the transfer of land. We REMAND for further proceedings to determine whether the land should be retained under BLM control and management or reconveyed to San Juan County under a newly proposed land use plan amendment. In the case of the FAA, the airport has already been built. This does not mean that a remand would be meaningless, however. On remand, the FAA should re-analyze the impact of the airport under section 4(f) and section 2208. The FAA may determine that it must make use of studies not utilized in the current FEIS. If a "significant" impact is found, section 4(f) and section 2208 require that all reasonable steps be taken to mitigate the damage or adverse impact. We therefore REVERSE the FAA's determination of no significant impact and REMAND to the FAA for further proceedings consistent with this decision."

In February 2001, the FAA issued for public and agency comment a Draft Supplemental EIS to address the issues raised by the Court; however, a Final Supplemental EIS was never issued. Guidance used in preparing this Draft Supplemental EIS includes FAA Orders 1050.1E and 5050.4B, as well as specific guidance (discussed later in **Section 3.2,** *Noise*) concerning the consideration of aircraft noise relative to parks. The BLM's 2008 Resource Management Plan[13] (2008 Approved RMP) addresses the BLM's actions and thus, this document does not address further the court case issues relative to BLM actions. This Draft Supplemental EIS replaces that 2001 Draft Supplemental EIS.

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9 U.S. Department of Transportation, Federal Aviation Administration, *Replacement Airport at Halls Crossing Final Environmental Impact Statement, San Juan County, Utah* (Washington, DC, May 1990), 4.42.

10 U.S. Department of Transportation, Federal Aviation Administration, *Replacement Airport at Halls Crossing Final Environmental Impact Statement, San Juan County, Utah* (Washington, DC, May 1990), xii.

11 All points reference exact language from the published documentation from the 1993 United States Court of Appeals case *National Parks Conservation Association, et al. v Federal Aviation Administration, et al.*

12 Note: Day-night average sound level is now referred to as DNL. At the time of the 1990 Final EIS, it was referred to as Ldn.

13 Bureau of Land Management Monticello Field Office, *Record of Decision and Approved Resource Management Plan* (November 2008).

1.2 Draft Supplemental EIS

In cooperation with BLM and NPS, FAA has prepared this Draft Supplemental EIS to address the Court issues using the newest FAA guidance. This Draft Supplemental EIS addresses:

(1) the measurement of actual aircraft noise levels in GCNRA and visitor survey;
(2) an updated evaluation of existing and future aircraft noise levels using the FAA's 2007 Guidance for Park-Related Supplemental Noise Studies;
(3) a Section 4(f) evaluation using the updated noise analysis; and
(4) an analysis on potential cumulative effects.

The Notice of Intent to prepare this Supplemental EIS was published in the Federal Register on August 26, 2010 (**Appendix C**, *Federal Register Notices*). In preparing this document, the FAA conducted additional scoping in September 2010. Two scoping comments were received: one from the NPCA and one from the Southern Utah Wilderness Alliance (SUWA). Both organizations requested that NPS be a cooperating agency. SUWA also expressed concern about BLM's disposal of the 370 acres of land for the Airport, as cited in the 2008 Approved RMP. Comments from the 2010 scoping effort can be found in **Appendix B**, *Scoping and Public Comments*.

NPS and BLM are cooperating agencies for this Draft Supplemental EIS. To define the roles of each cooperating agency, a Memorandum of Agreement was signed by the FAA and BLM in 2004, and a Memorandum of Understanding was signed by the FAA and the NPS in 2011 before preparing this document (**Appendix D**, *Agency Coordination*). These agreements provide the framework and identify responsibilities of each agency in the preparation of this document. The NPS and BLM concurred with the findings in this Draft Supplemental EIS on October 9, 2014 and October 24, 2014, respectively (**Appendix D**, *Agency Coordination*).

This Draft Supplemental EIS is being released for public and agency review and comment. Following FAA NEPA procedures, upon receipt of comments, the FAA expects to prepare a Final Supplemental EIS. No sooner than 30 days after issuance of this Final Supplemental EIS, it is expected that FAA will determine if the issuance of a Record of Decision (ROD) is appropriate. If approved, FAA would have completed its requirements to enable BLM to convey land to San Juan County.

1.3 Updated Airport Activity Data and Forecast

Three airports were considered in the analysis in the 1990 Final EIS (see **Figure 1-1**):

- the airport to be replaced (the now closed Halls Crossing Airport);
- the new/replacement airport (Cal Black Memorial Airport); and
- Bull Frog Basin Airport.

In order to prepare an updated impact analysis, an updated inventory of the conditions at each airport was necessary and existing and future aviation activity data were needed. **Appendix E,** *Existing and Future Airport Conditions* provides information about each airport as well as past and present activity. Based on standard forecasting techniques, a forecast of activity through 2030 was prepared. The preparation of the forecast is also documented in **Appendix E**.

Part of the purpose and need for the 1990 Final EIS for the replacement airport at Halls Crossing was to address increasing demand for aircraft services in the GCNRA area. While the 1990 Final EIS forecast predicted 24,100 operations in 2005, only about 1,800 operations actually occurred at Cal Black Memorial Airport, as shown in **Table 1-1.**

Aviation forecasts for the three airports considered in this Draft Supplemental EIS were conducted to determine reasonably foreseeable aviation activity in the area and to form the basis of the environmental impact analysis. To maintain consistency with the 1990 Final EIS analysis, and because Cal Black

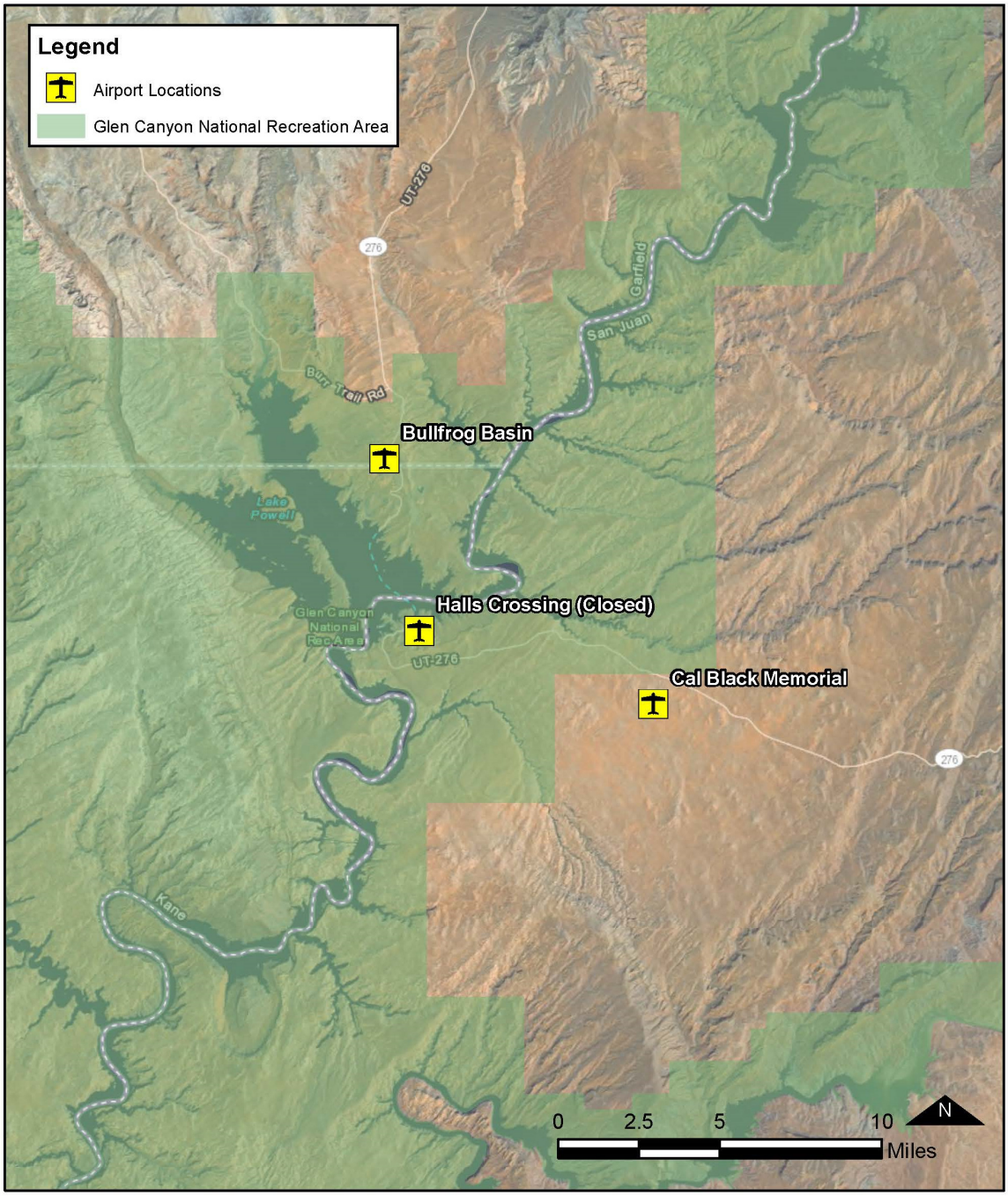

Figure 1-1 Cal Black Memorial, Bullfrog Basin, and Halls Crossing Airports

Memorial Airport has been constructed and operational, the forecasts for this Draft Supplemental EIS use a twenty-year outlook. Table 1-2 presents existing and forecast aircraft activity which was then used in preparing the impact analysis presented in Chapters II and III.

Table 1-1: Historical Aviation Activity at Cal Black, Halls Crossing, and Bullfrog Basin Airports

Year	Annual Aircraft Operations						
	Cal Black Memorial Airport Operations					Halls Crossing Operations	Bullfrog Basin Operations
	Single Engine[1]	Multi Engine[1]	Jet Engine[1]	Helicopter[1]	Total		
1980	NA	NA	NA	NA	NA	2,434	3,650
1985	NA	NA	NA	NA	NA	2,000	6,747*
1990	NA	NA	NA	NA	NA	NA	9,650
1995	2,666	278	14	84	3,042	NA	6,500
1996	2,428	350	10	84	2,872	NA	6,490
1997	2,212	314	2	92	2,620	NA	6,550
1998	2,330	334	38	66	2,768	NA	6,620
1999	2,164	378	34	90	2,666	NA	6,690
2000	2,188	262	88	124	2,662	NA	NA
2005	1,446	200	58	50	1,754	NA	NA
2009	1,138	150	20	62	1,370	NA	NA

Source: Aviation data was provided by Cal Black Memorial Airport: Midway Aviation/Cal Black Memorial Airport. Bullfrog: *Final Environmental Impact Statement for Replacement Airport at Halls Crossing, San Juan County, Utah,* May/1990, FAA Form 5010-1 Airport Master Record for Bullfrog Basin (1/1/98), San Juan County, and Cal Black Memorial Airport Noise Analysis Report (2013).

[1] These data were recorded for Cal Black Memorial Airport only.

* Estimate from Utah Department of Aviation, NA: Not Available – as records were not maintained

** Halls Crossing Airport closed and Cal Black Memorial Airport opened in 1992.

Table 1-2: Existing (2010) and Future (2030) Annual Operations by Aircraft Category

Aircraft Category	Cal Black Memorial Airport		Bullfrog Basin		Halls Crossing (Closed)*	
	2010	2030	2010	2030	2010	2030
Single Engine Propeller	1,137	1,412	1,344	1,686	1,137	1,412
Multi Engine Propeller	151	188	178	224	151	188
General Aviation Jet	14	17	16	20	0	0
Helicopter	69	86	82	102	69	86
Total	**1,371**	**1,703**	**1,620**	**2,032**	**1,357**	**1,686**

Source: Cal Black Memorial Airport Noise Analysis Report (2013)

*It is assumed that the operations at closed Halls Crossing would be the same as the actual operations that occur at Cal Black Memorial Airport, with one exception. The length of the runway at the closed Halls Crossing Airport was too short to accommodate jets. Thus, the actual activity minus the jets represents the surrogate existing activity at closed Halls Crossing Airport.

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II. AFFECTED ENVIRONMENT

While evaluation of all environmental resources was conducted for the 1990 Final EIS, the Supplemental EIS focuses evaluation on the issues associated with the Court remand: noise impacts on GCNRA and the visitor experience. Because the Court remand focused specifically on noise-related issues, the following environmental disciplines specified by FAA Order 1050.1E (Change 1) were not re-evaluated:

- Land Use
- Socio-economic Resources
- Air Quality
- Water Quality
- Biotic Communities
- Threatened and Endangered Species
- Wetlands
- Floodplains
- Coastal Zones
- Wild and Scenic Rivers
- Farmlands
- Energy Supply and Natural Resources
- Solid Waste
- Light Emissions
- Construction Impacts
- Design, Art, and Architectural Resources

Chapter II, *Affected Environment*, provides an overview of the recreation areas, their characteristics, and visitation activity. While FAA Order 1050.1E and 5050.4B identify a wide range of issues that are considered in an Affected Environment chapter, this chapter focuses exclusively on the issues necessary to understand the impact analysis documented in **Chapter III**, *Environmental Consequences*.

2.1 GCNRA Location and Characteristics

The GCNRA is located in southwestern Utah and northeastern Arizona. Portions of the recreational area are within Kane, Garfield, San Juan, and Wayne counties in Utah and Coconino County in Arizona. The Navajo Indian Reservation serves as its southern boundary. Adjacent to the recreation area are the Navajo Nation Chapters of the Oljeto, Navajo Mountain, Kaileto, LeChee, and Gap-Bodaway.

The NPS administers public lands within GCNRA, while the BLM administers public land within the Escalante Resource and other lands adjoining the recreation area. The total area comprising GCNRA is about 1,255,000 acres. Glen Canyon is located on the Colorado Plateau in the heart of some of the nation's most rugged canyon country. Lake Powell, comprising about 13% of the total recreational area, is the nation's second largest manmade lake, and is the most prominent single feature of the recreation area. GCNRA abuts four other major NPS resources: Canyonlands National Park, Capitol Reef National Park, Rainbow Bridge National Monument, and Grand Canyon National Park (see **Figure 2-1**).

Because of the rugged terrain, road access to the area is limited. U.S. Highways 89 and 89A and Arizona Highway 98 provide access to the south end of the area. Utah State Highway 95 provides access to the northern portion of the area with paved spur roads leading to Halls Crossing and Bullfrog Basin Airports. Initiated in 1985, a Ferryboat operation provides access between Halls Crossing and Bullfrog.[14] U.S. Highway 163 and a dirt road provide access to San Juan Marina across the Navajo reservation. Road access to other parts of the area is limited to dirt roads, making the area popular for four-wheel driving.

Lake Powell holds up to 27 million acre-feet of water, and has a surface area of about 255 square miles. It stretches along 186 miles of the Colorado River and 75 miles of the San Juan River. Geologically, the area consists primarily of Jurassic sandstone 140 to 200 million years old. Wind-deposited sediments that

[14] U.S. Department of the Interior, National Park Service, *Statement for Management: Glen Canyon National Recreation Area* (May 1989).

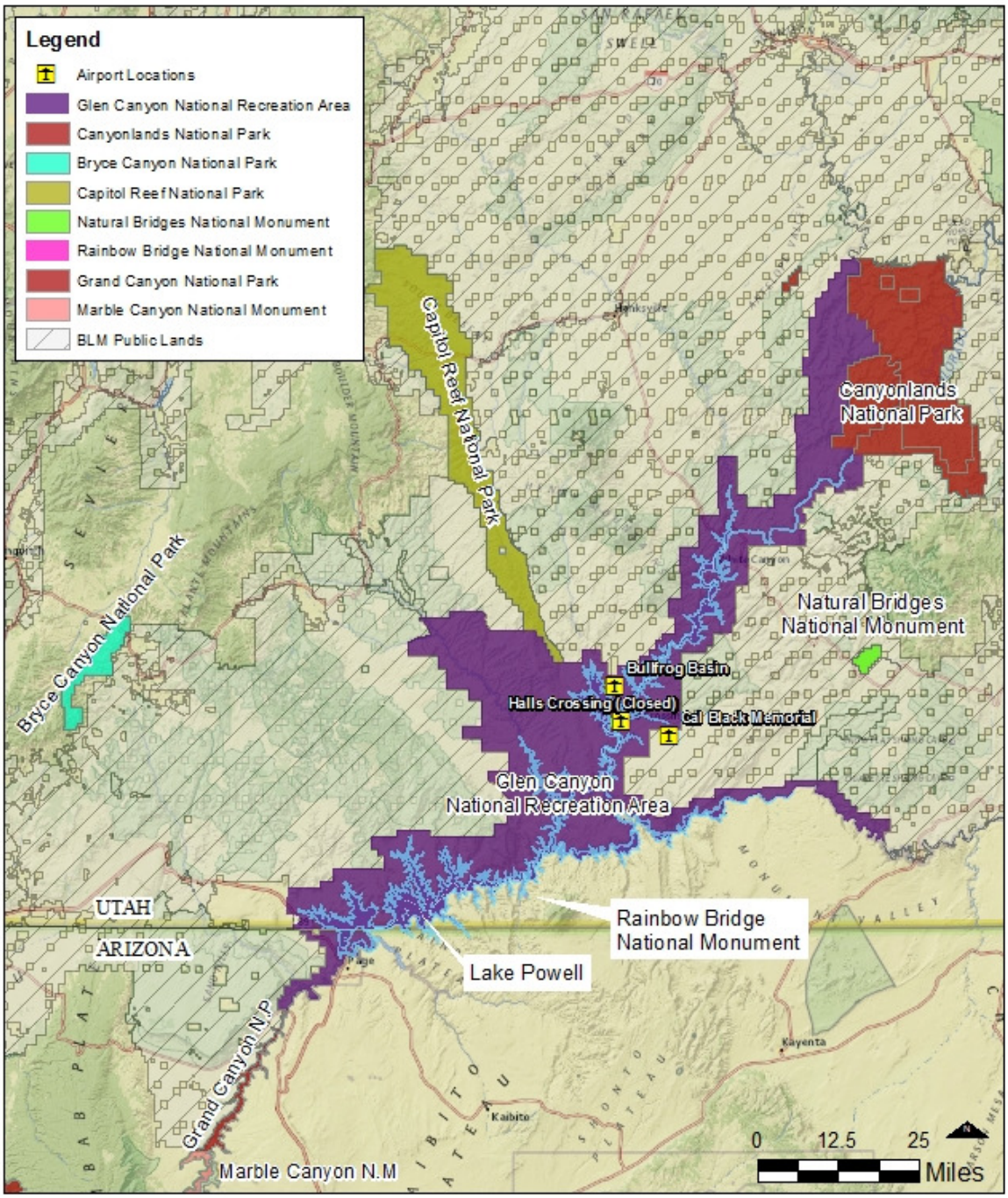

Figure 2-1 Bureau of Land Management and National Park Service Lands

Service Layer Credits: National Geographic, Esri, DeLorme, NAVTEQ, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC

became massive sand dunes and water-deposited marine sediments eventually consolidated into porous, loosely cemented sandstone. The process of uplifting and rapid erosion has produced numerous cliffs, spires, pinnacles, arches, and natural bridges throughout the area.

The areas support a wide variety of Colorado Plateau plant communities ranging from the dominant cold, desert shrub-grassland to cottonwood, willow and tamarisk groves near streams and Utah Juniper and pinyon woodland at high elevations. There are 26 isolated buttes and mesa tops that support relic grassland vegetation, indicative of pre-settlement conditions throughout the Colorado Plateau. Nearly 900 species of plants have been identified. An abundance of animals reside on the lands. The area supports 80 mammal species, approximately 200 resident and transient bird species, and about 40 species of reptiles and amphibians. Striped bass, largemouth bass, smallmouth bass, black crappie, walleye and other game fish have been stocked in Lake Powell and represent a major source of recreation to visitors to the recreation area.[15]

2.2 Recreational Activity and Visitors

GCNRA (and adjacent Rainbow Bridge National Monument) has the distinction of being one of the most visited NPS units in the Colorado Plateau region. In 2012, there were over 2 million visitors, with over 1.6 million overnight stays in GCNRA. While visitation doubled from 1980 to 1990, it waned in the 1990s and 2000s. Visitation tripled from 1 million in 1975 to over 3 million in 1993. Since that time, visitation has decreased and ranges from 1.8 to 2.6 million visitors per year.[16]

Water-oriented sports are the predominant recreation activities in the GCNRA. Over 95 percent of visitors come to the recreation area to access the water, while other visitors come the area to hike. Pleasure boating, water-skiing, swimming, and beach camping are main summer activities. Sports fishing and concessionaire tour boat rides constitute major year-round activities. In addition to water activities, the areas recreational uses also include river running, hiking wilderness trails, four-wheel driving on backcountry roads, hunting and trapping.

According to the 1989 *NPS Statement for Management Glen Canyon National Recreation Area,* which provided "an up-to-date inventory of the parks condition and an analysis of its problems," [17] backcountry uses within GCNRA are few when compared to water-oriented recreational use. However, day hiking is becoming increasingly popular as a supplement to beach camping. Persons planning to hike overnight within the recreation area are required to obtain a free Backcountry Use Permit before commencing; overnight hikers visiting BLM administered lands need to obtain the same permit. These permits help provide statistical information which assists resource monitoring and management.

Visitor access occurs throughout the year, but, as mentioned previously, visitation is dominant during the summer months, with the majority of visits occurring between April and October. The months of June, July, and August are the peak months and accommodate about half of the annual visits. August represents the peak month, with Memorial Day and Labor Day weekends being the peak weeks.

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15 U.S. Department of the Interior, National Park Service, *Statement for Management: Glen Canyon National Recreation Area* (May 1989).

16 U.S. Department of the Interior, National Park Service, *Recreation Visitors by Month, 1979 – Last Calendar Year (2013)*, Glen Canyon National Recreation Area, https://irma.nps.gov/Stats/SSRSReports/Park Specific Reports/Park All Months?Park=GLCA&RptYear=2013.

17 U.S. Department of the Interior, National Park Service, *Statement for Management: Glen Canyon National Recreation Area* (May 1989).

2.3 NPS General Management Plan Zoning

Adopted from the 1979 *NPS Glen Canyon National Recreation Area Proposed General Management Plan, Wilderness Recommendation, Road Study Alternatives Final Environmental Impact Statement* (herein referred to as the NPS General Management Plan), the NPS uses the following management zoning classifications for uses in GCNRA. **Figure 2-2** shows the management land use zoning characteristics of GCNRA.

- Natural Zone (also identified as proposed wilderness);
- Recreation and Resource Utilization Zone;
- Development Zone; and
- Cultural Zone.

The Natural Zone within the recreation area consists of nearly 670,000 acres. It includes scenic resources and relatively undisturbed areas. The NPS's stated purpose for these lands is the maintenance of isolation and natural processes. Backcountry recreation is encouraged in this zone, and vehicles and mechanized equipment are prohibited. In 1980, approximately 588,855 acres of Glen Canyon were proposed for wilderness designation. The proposed wilderness is geographically congruent with the Natural Zone and is managed to protect wilderness character in accordance with NPS Management Policies. NPS manages eligible, study, proposed, recommended, and designated wilderness areas to provide outstanding opportunities for solitude, according to the Wilderness Act and the conservation requirements of the Organic Act.

The Recreation and Resource Utilization Zone consists of almost 560,000 acres, including Lake Powell and most adjoining lands not included in the Natural Zone. Within this zone the NPS provides recreational opportunities. Motorized vehicles are allowed on the Lake, designated roads and in the Lone Rock off-road use area. Utility and transportation systems may be allowed in this zone where appropriate.

The Development Zone consists of about 19,300 acres and is allotted to recreational support facilities and visitor services. The Cultural Zone includes 25 acres and is designated to preserve the archaeological and paleontological resources of the area. (Note: the Cultural Zone does not appear in **Figure 2-2** because it not located within the Initial Area of Investigation (IAI) (see Section 3.2, Noise Analysis) and is located within the geographical extent of the map.)

2.4 Paleontological Resources

The Glen Canyon National Recreation Area contains numerous historic, paleontological, and cultural resources. The Colorado River and its tributaries have cut through thousands of feet of sedimentary rock, exposing extensive fossil-bearing formations. According to NPS, rock formations in the area of Hall's Crossing and Cal Black Memorial Airport include Jurassic bedrock as well as Quaternary surficial deposits.[18] In this area, fossiliferous rock units include the Jurassic Navajo and Kayenta Sandstones from which many fossilized trackways from dinosaurs and other extinct, desert-dwelling creatures have been identified throughout this region.

According to NPS, paleontology resources in the park include many types of trace fossils, such as tracks and Pleistocene mammoth dung, as well as body fossils, like petrified wood and Cretaceous dinosaur remains. Fossils from most geologic time periods from the Pennsylvanian (318 Mya} to the Pleistocene Epochs (ended approximately 11,700 years ago} can be found in Glen Canyon.

[18] Willis, G.C., 2009, Interim geologic maps of the Bullfrog, Halls Crossing, Halls Crossing NE, Ticaboo Mesa, and Knowles Canyon quadrangels, Glen Canyon National Recreation Area, Garfield and San Juan Counties, Utah: Utah Geological Survey Open-File Report, scale 1:24,000

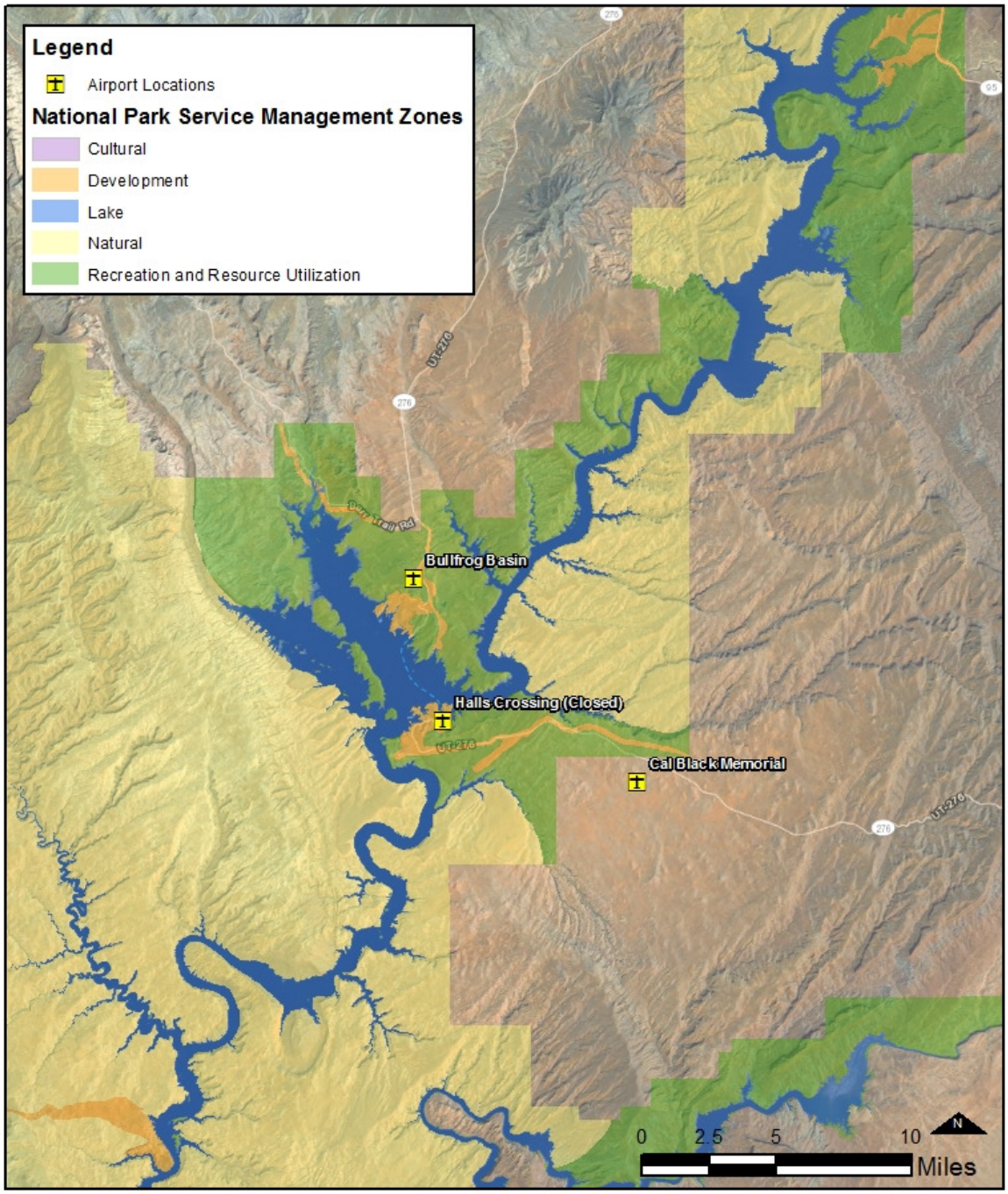

Figure 2-2 National Park Service Management Zones

Note: Cultural Zone is identified in the legend because it is a National Park Service Management Zone; however none of the area shown on the map is designated as Cultural Zone.

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Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

2.5 Cultural Resources

GCNRA is part of the archaeological area known as the "Four Corners," which encompasses southwest Colorado, southeast Utah, northwest New Mexico, and northeast Arizona. This area was once the hub of a network of prehistoric communities and trade routes throughout the Southwest. Materials found in this area that are related to the Paleo-Indian culture have been carbon dated to between 12,500 and 7000 B.C. The Archaic or Desert Archaic people occupied the northern Colorado Plateau region as seasonal hunters and gatherers between approximately 6400 B.C. and A.D. 450.

Around 1 A.D., the Ancestral Puebloan people were found to exist in the area. According to NPS, the Ancestral Puebloan people were practitioners of agriculture and/or horticulture, a more sedentary lifestyle than hunting and gathering alone. The most intensive occupation occurred in Pueblo II and early Pueblo III (A.D. 1050-1225) in natural canyon alcoves. The Ancestral Puebloan people migrated away from the area during the late Pueblo III times, about 1300 A.D. Their ancestral homesites on federal lands are still referenced in prayers and ceremonies.

According to NPS, contemporary descendants of the American Indians who occupied the Glen Canyon landscape include the Hopi, Pueblo of Zuni, Navajo, and Southern Paiute inclusive of the San Juan Southern Paiute, as well as the Ute Mountain Ute. The area is still remembered and referenced in their cultural traditions. European settlement of the area began with the Dominiguez- Escalante party passage through the area in 1776. The Hole-In-The-Rock Trail, located about three miles south of Cal Black Memorial Airport, is an historical reminder of the Mormon missionaries and their influence in the area. In 1874, a government fort was constructed at Lees Ferry. In 1869 and 1871, John Wesley Powell explored the area.

2.6 Climate

Research has shown that there is a direct correlation between fuel combustion and greenhouse gas emissions. Therefore, sources that require fuel or power at an airport are the primary sources that would generate greenhouse gases. In terms of relative U.S. contribution, the U.S. General Accounting Office (GAO) reports that aviation accounts "for about 3% of total U.S. greenhouse gas emissions from human sources, according to EPA data" compared with other industrial sources, including the remainder of the transportation sector (20%) and power generation (41%).[19] The International Civil Aviation Organization (ICAO) estimates that greenhouse emissions from aircraft account for roughly 3 percent of all anthropogenic greenhouse gas emissions globally. Climate change due to greenhouse gas emissions is a global phenomenon, so the affected environment is the global climate.[20]

The scientific community is continuing efforts to better understand the impact of aviation emissions on the global atmosphere. The FAA is leading and participating in a number of initiatives intended to clarify the role that commercial aviation plays in greenhouse gas emissions and climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e.g., NASA, NOAA, USEPA, and DOE), has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions. FAA also funds the Partnership for AiR Transportation Noise & Emissions Reduction (PARTNER) Center of

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[19] IPCC Report as referenced in U.S. General Accounting Office (GAO) *Environment: Aviation's Effects on the Global Atmosphere Are Potentially Significant and Expected to Grow*; GAO/RCED-00-57, February 2000, p. 14; GAO cites available EPA data from 1997.

[20] As explained by the U.S. Environmental Protection Agency, "greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment but other regions of the world as well; likewise, emissions in other countries can affect the United States." Climate Change Division, Office of Atmospheric Programs, U.S. Environmental Protection Agency, *Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act* 2-3 (2009), available at http:// epa.gov /climatechange/endangerment.html.

Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition. Similar research topics are being examined at the international level by the ICAO.[21]

2.7 Visitor Reaction to Noise

Responding to the 1993 court decision, which commented on the need for empirical evidence when determining the impact of the project on visitors' recreational experience, a survey of visitors to GCNRA was conducted for the Supplemental EIS. **Appendix F,** *Summary of Noise Studies in GCNRA* provides summaries of past research concerning noise in national parks and visitor reaction to that noise. This past research provides context for the Supplemental EIS surveys.

2.7.1 Actual Visitor Reaction to Noise in Glen Canyon National Recreation Area (1998)

According to the 1993 court decision, the U.S. Court of Appeals Tenth Circuit required that the FAA should re-analyze the impact of Cal Black Memorial Airport under Section 4(f) and section 2208 (see **Appendix A,** 1993 Court of Appeals Case: *National Parks Conservation Association, et al. v Federal Aviation Administration, et al*). As a result, in 1998, an in-person interview survey was conducted.

The survey instrument was designed in consultation with the NPS, the BLM, and San Juan County. The survey was designed to be compatible both with the many social surveys of aircraft noise impacts near major airports that have been conducted, and with the newer group of surveys of impacts of noise on visitor experience in national parks. The survey was designed to measure the amount of annoyance caused by aircraft noise from aircraft operating out of Cal Black Memorial Airport and also by several other possible sources of annoyance for comparative purposes. It was also designed to measure the extent to which such noise interfered with visitors' enjoyment of natural soundscape and the sounds of nature, an issue of increasing concern to the NPS. An attempt was made to contact as wide a range of park visitors as possible, but the majority of respondents available consisted of those whose major activities center around boating and other water activities on Lake Powell.

2.7.1.1 Survey Methodology

The questionnaire on which the interview was based is presented in full in **Appendix G**, *Visitor Survey*. It was designed in consultation with the cooperating agencies to measure aircraft noise annoyance in an unobtrusive manner, in the guise of a general survey of park visitor experience. To this end, a variety of questions were asked about the experience of the visitor, including questions about annoyance with other sources than aircraft noise, to provide a context in which to interpret the annoyance results. In addition, interference with enjoyment of natural soundscape and the sounds of nature was also measured with respect to several possible sources, including aircraft noise. Finally, exposure to aircraft noise was measured informally by asking respondents to report the number of aircraft they heard during their visit. . The interference with natural soundscape questions were designed to be comparable to those used in previous surveys like the NPS 1994 *Report to Congress* (see summary of the NPS 1994 *Report to Congress* in **Appendix F,** *Summary of Noise Studies in Parks*). In addition, every effort was made to render the survey comparable both to previous noise annoyance studies at airports as well as to previous studies of noise impact in national parks.

[21] Lourdes Q. Maurice and David S. Lee. *Chapter* 5: *Aviation Impacts on Climate.* Final Report of the International Civil Aviation Organization (ICAO) Committee on Aviation and Environmental Protection (CAEP) Workshop. October 29th November 2nd 2007, Montreal. http://www.icao.int/icaonetIcnfrstICAEP/CAEP SG_20082/docs/Caep8_SG2_ WPI0.pdf

The survey data were collected by an in-person interview technique from adult visitors to GCNRA during the two-week period from May 22, 1998 until June 4, 1998; this period included Memorial Day weekend (a very busy visitor period for GCNRA). The survey team approached about 59% of the available groups at the locations that were sampled. Based on an informal count on the first two days of sampling, about 95% of the groups approached said they were exiting at that time. Based on these two figures, about 575 visitor groups were available to the team during the period sampled, representing about 57.5% of the groups that could have been visiting this region of the park during that period (the NPS records only "visits," or people per day in the park, not the number of groups visiting so this can only be estimated). Only one respondent in each visitor group that was approached was interviewed.

The survey team approached visitors at one of five main sites:

- Bullfrog Marina
- Marina public boat launch ramp
- Bullfrog Marina concession boat area
- Halls Crossing Marina public boat launch ramp
- Halls Crossing Marina concession boat area

In addition, surveys were conducted at Hole-in-the-Rock trailhead, near Cal Black Memorial Airport, and for the covered slip area on the Bullfrog side. Different sites were sampled at different times of day in order to maximize the number of groups available for sampling at those locations. Furthermore, sampling was concentrated at the marina sites on weekends, elsewhere midweek for the same reason. Because some of the backcountry users exited at one of the marina sites, this approach did succeed in capturing a few backcountry users. Many of these backcountry users, however, remained un-sampled because of the difficulty of encountering them on their exit from the area and because their numbers were low during the sample period (backcountry users are most frequent in spring and fall).

2.7.1.2 Aircraft Noise Annoyance

The survey included questions directly related to annoyance and aircraft audibility. Although GCNRA is for the most part a very quiet place, there are many overflights per day of enroute jet aircraft and also some general aviation. General aviation operations include those associated with the two operational airports considered in this study (Cal Black Memorial Airport and Bullfrog Basin Airport) and also those operations associated with airports located outside of the park (i.e., airports in Page, Arizona, Grand Junction, Colorado, Montrose, Colorado, Farmington, New Mexico, and Northern Utah).[22] Almost three-quarters of respondents reported hearing aircraft during their stay (72.5%), 44% reported hearing low-flying aircraft (the type of interest for Cal Black Memorial Airport operations), and 41.2% reported hearing high-flying aircraft. The mean number of aircraft reported was 2.8, the mean number of low-flying aircraft was 1.1, and the mean number of high-flying aircraft was 1.6. The study revealed that for an average stay of over 4 days, the average visitor probably observed less than one audible aircraft per day and only one general aviation aircraft during the entire stay.

The survey included a free response question about annoyance by anything during the visit, and a minority of respondents reported being annoyed by anything. Of the things that did annoy visitors, the most frequent things mentioned were jet skis (9.8%), other visitors (7.3%), boaters (5.9%), rangers (3.9%), and some natural factors like wind (3.6%) and animals (3.3%). Non-aircraft noise sources were mentioned by 8 respondents (2.3%) but, on the free response question, aircraft noise was not mentioned by anyone. Of those who were annoyed by something, considerable annoyance was expressed: 33.4% reported moderate to extreme annoyance. Moderate to extreme annoyance with other visitors (11.3%) and with noise from boats (6.4%) was also expressed in response to specific questions. Thus, the respondents were willing to express annoyance, including annoyance with park rangers, to the interviewer, who was often perceived to be a park employee.

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[22] U.S. Department of Transportation, Federal Aviation Administration, *Replacement Airport at Halls Crossing Final Environmental Impact Statement, San Juan County, Utah* (Washington, DC, May 1990), 4.2.6.

As the survey progressed after establishing general (non-aircraft) noise experiences, additional information was sought from the visitor about their reaction to aircraft. The responses to the aircraft annoyance question showed that the respondents reported very little aircraft noise annoyance. Only 4.8% of the study's visitor survey respondents reported even the slightest degree of annoyance with aircraft noise (although 72.5% heard aircraft), and the percentage of those expressing moderate to extreme annoyance (the usual group identified as impacted in FAA and NPS noise impact surveys) was only 2.6% (± 1.4%). Only 1 of 358 respondents (0.3%) was extremely annoyed by an aircraft, and this apparently resulted from a "low-flying" aircraft operating near a canyon. This is considerably less annoyance than was reported from other noise sources, and based on the statistics, FAA believes that the responses show that this sample of respondents did not perceive aircraft noise to be a significant source of annoyance. These numbers compare favorably to the 1992 exit survey of GCNRA visitors[23] in which about 4% reported moderate or greater annoyance with aircraft noise during their visit.

One question was specifically designed to measure the annoyance of any visitors who had done any backcountry hiking during their stay. Of the 358 respondents who answered this question, 24 (6.7%) had done some backcountry hiking. Of these backcountry hikers, only seven (7) (29.2%) reported hearing aircraft while they were in the backcountry. And of those seven (7), three (3) (42.9%) reported being annoyed by hearing the aircraft, although only one (1) reported being moderately or more annoyed.

2.7.1.3 Interference with Natural Soundscape

The responses to questions that specifically addressed interference with enjoyment of natural soundscape and the sounds of nature were highly similar to those to questions relating to annoyance. To provide a context for these results, note again that enjoyment of natural soundscape was a very important reason why visitors came to Glen Canyon, and the majority (75.1%) of respondents reported that they enjoyed it either "quite a bit" or "extremely much." Although they enjoyed the scenery and boating more, and those who camped enjoyed camping about the same, it is clear that respondents' enjoyment of the natural soundscape of Glen Canyon was substantial. Thus, it is not surprising to find that very few respondents reported much interference with their enjoyment of natural soundscape from any source.

The data show that in this sample, reported interference with enjoyment of natural soundscape by aircraft was minimal. Significantly more interference with natural soundscape was reported from other sources, such as jet skis and partying. Only 10 of 358 respondents (2.8%) reported even the slightest degree of interference by aircraft noise, although two (2) reported extreme interference. These numbers are somewhat lower than found in the 1992 exit survey (8%)[24], and are also lower than the annoyance question.

2.7.1.4 Noise Complaints Associated with Glen Canyon National Recreation Area

Another avenue for public expression of visitor noise concerns is the submittal of noise complaints. In the past, NPS recorded noise complaints associated with various park facilities at GCNRA; however, NPS indicates that specific records are no longer maintained.[25] Copies of all complaints were requested from the NPS in mid-2003 and subsequently in 2013. In 2003, NPS provided the FAA with records of 466 aircraft noise event complaints logged between January 1991 and August 2002. Of the 466 events, 300 (64.4%) were associated with military aircraft overflights. None of the airports (Cal Black Memorial Airport, the old Halls Crossing Airport, or Bullfrog Basin Airport) accommodate military flights on regular basis; thus, the substantial majority of complaints were associated with high altitude enroute aircraft. Of the remaining

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23 McDonald, C.D., Baumgartner, R.M. and R. Iachan. *National Park Service Visitors Survey*. HMMH Report No. 290940.12, NPOA Report No. 94-2 (1994).

24 McDonald, C.D., Baumgartner, R.M. and R. Iachan. *National Park Service Visitors Survey*. HMMH Report No. 290940.12, NPOA Report No. 94-2, (1994).

25 Theresa Ely, e-mail message to Janell Barrilleaux, "Re: Request for update on noise complaint data," October 17, 2013.

complaints, 94 (20.2%) were associated with civilian aircraft, and 72 (15.5%) were unknown relative to the aircraft. Thus, of the non-military complaints, it appears that over a 10-year period, a total of 166 noise/low-flying events triggered complaints – or about 17 events a year. The year with the lowest number of recorded complaint events was in 2001, with 7 events reported in 5 complaints; the greatest number being in 1995 with 57 noisy/low-flying events in 38 complaints.

Of the 94 civilian aircraft related noise complaints, the following comments were noted:

- 20% noted rotary wing aircraft (helicopters), which are presumed to be associated with area sight-seeing (discussed in Section 2.2.2.4), and not operations at any of the three airports;
- 53% were associated with low flying aircraft. Such low flying complaints are often associated with flight seeing/air tours and were reported ranging from 500 feet about ground to 15 feet above ground (Note: thousands of air tours are conducted over GCNRA each year. These operations do not use Cal Black Memorial Airport. According to the US Government Accountability Office, in 2006 operators had the authority to conduct a combined total of 14,074 air tours annually over GCNRA.[26] Due to a combination of operators going out of business and the adjustment of interim operating authority allowances, as of 2013, operators were allowed to fly a maximum of 8,222 air tours per year over GCNRA;[27] however, according to the FAA Annual Report, only 4,437 air tour operations over GCNRA were reported in 2013;[28] and
- 10% of the commenters specifically noted that the overflight was associated with "sightseeing flights" (Note: most aviation sight-seeing flights depart and return to the Page, Arizona airport).

A review of the complaints indicates that while in 1998 there were 42 events triggering complaints, none of the complaints occurred during the visitor survey period.

In August 2013, the FAA requested updated noise complaint data from NPS. Specific detailed complaint data was not available, but NPS indicates that a general complaint regarding inappropriate aircraft noise in the Rainbow Bridge National Monument (which is located in GCNRA) had been received.[29]

2.8 2007 FAA Guidance for Park-Related Supplemental Noise Studies

FAA's 2007 Guidance for Park-Related Supplemental Noise Studies provides a specific methodology for assessing noise impacts within noise-sensitive environments such as GCNRA (**Appendix I**, *FAA Guidance for Park-Related Supplemental Noise Studies)*.

This 2007 guidance provides FAA regional offices and airport sponsors with appropriate methodology and procedures for evaluating agency actions that could affect the sound environments of National Parks and other quiet setting properties. The framework for the guidance includes five elements:

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[26] U.S. Government Accountability Office, *National Parks Air Tour Management Act: More Flexibility and Better Enforcement Needed*, GAO-06-263 (January 2006).

[27] U.S. Department of Transportation, Federal Aviation Administration, *National Parks Air Tour Management Program Glen Canyon National Recreation Area and Rainbow Bridge National Monument Voluntary Agreement Kick-Off Meeting, General Route Patterns* (PowerPoint presented on September 11, 2013).

[28] U.S. Department of Transportation, Federal Aviation Administration, *Reporting Information for Commercial Air Tour Operations over National Park Units, 2013 Annual Report* (April 29, 2014). http://www.faa.gov/about/office_org/headquarters_offices/arc/programs/air_tour_management_plan/documents/FAA-NPS-2013-Report.pdf

[29] Theresa Ely, e-mail message to Janell Barrilleaux, "Re: Request for update on noise complaint data," October 17, 2013.

- Noise Screening Assessment;
- Interagency Coordination;
- Protocol Submission and Approval;
- Noise Measurement Program; and
- Main Noise Analysis.

The noise analysis methodologies use the standard aircraft noise evaluation as well as a supplemental noise assessment that captures potential noise impacts in noise-sensitive settings. This guidance was the foundation for the noise analysis for this Draft Supplemental EIS (see **Appendix H**, *Noise Study* for the noise protocol).

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III. ENVIRONMENTAL CONSEQUENCES

As discussed in **Chapter I**, *Introduction, Background, and Activity Forecast*, this Draft Supplemental EIS was prepared in direct response to the 1993 court decision (*National Parks Conservation Association vs. Federal Aviation Administration*). Because the U.S. Court of Appeals, Tenth Circuit remanded the 1990 Final EIS decision back to the FAA for further specific environmental analysis, this Draft Supplemental EIS focuses exclusively on the re-analysis of potential noise-related impacts resulting from the operation of Cal Black Memorial Airport. **Chapter III**, *Environmental Consequences,* presents the analysis for potential noise impacts, Section 4(f) impacts, and Cumulative Effects resulting from the continued operation of the Cal Black Memorial Airport.

3.1 Introduction and Summary

This chapter describes potential environmental consequences that could result from the continued operation of the Cal Black Memorial Airport to resources located within the Project Area (consisting of the Initial Area of Investigation which is discussed in more detail in **Section 3.2**, *Noise Analysis*). Direct effects of the new airport (its construction) as well as indirect effects (airport operations) were identified in the 1990 Final EIS. Because the Court remanded the FAA decision for further evaluation of aircraft noise, this 2014 Draft Supplemental EIS provides further evaluation of actual and potential aircraft noise impacts, as well as Section 4(f) impacts and cumulative impacts. Evaluation of noise impacts focuses exclusively on the indirect effect of aircraft noise on GCNRA and surrounding lands.

The noise analysis for this Draft Supplemental EIS was designed to:

1) quantify the noise exposure in GCNRA from aircraft operations associated with Cal Black Memorial Airport;
2) determine the impact of that noise on visitors to GCNRA and on properties protected under Section 4(f);
3) show the project-related noise changes that have occurred and those reasonably foreseeable; and
4) determine if the impacts were significant, and if significant, identify mitigation.

This project-related comparison was performed by comparing noise conditions for a No Action scenario, which includes the old Halls Crossing Airport (now closed) and Bullfrog Basin Airport, versus a With Project scenario, which includes the replacement airport, Cal Black Memorial Airport, and Bullfrog Basin Airport. The existing future conditions consider effects in year 2030, based on the forecasts presented in the prior chapter. Note that Bullfrog Basin Airport is included in both scenarios because it is located in GCNRA and has been in operation throughout the period that Halls Crossing and then Cal Black Memorial Airports was in operation.

Aviation forecasts for the three airports considered in this Draft Supplemental EIS were conducted to determine reasonably foreseeable aviation activity in the area and to form the basis of the environmental impact analysis. The 1990 Final EIS employed the methodologies required at the time, and used a twenty-year forecast for aviation activity, as is typical to aviation forecasting. NEPA documents are required to examine the time period which is reasonably foreseeable; given the general variability that has existed in the aviation sector, FAA has interpreted this in many NEPA documents to be an evaluation of conditions five years after project completion. To maintain consistency with the 1990 Final EIS analysis, and because Cal Black Memorial Airport has been constructed and operational, the forecasts for this Draft Supplemental EIS use a twenty-year outlook.

The *Section 4(f) Evaluation* provided in **Section 3.3** analyzes the potential impacts of the continued operation of Cal Black Memorial Airport on lands protected under Section 4(f) of the Department of Transportation Act of 1966 [recodified at 49 U.S.C. § 303(c)]. Lands considered protected under Section 4(f) include publicly-owned parks, recreation areas, and wildlife and waterfowl refuges of national, state, or local significance, and public or private historic sites of national, state, or local significance.

Cumulative effects related to noise were evaluated to determine if Cal Black Memorial Airport, when added to other past, present, and reasonably foreseeable future actions, contributes to environmental impacts in the area. Because the Airport was constructed and has been in operation for over two decades, the analysis focuses on whether the Airport currently contributes, or will contribute incrementally, to future noise impacts in the area.

Based upon extensive analysis of these resources, the FAA has concluded that the replacement airport for Halls Crossing at Cal Black Memorial Airport has neither had a significant effect on noise nor uses Section 4(f) resources. Similarly, cumulatively, based on the analysis in this Draft Supplemental EIS, the FAA has concluded that the reasonably foreseeable future impacts are not expected to be significant.

3.2 Noise Analysis

This noise analysis was conducted for the Draft Supplemental EIS to determine the potential impacts as a result of the closure of the old Halls Crossing Airport and the opening and operation of the Cal Black Memorial Airport. Specifically, the noise analysis was used to determine the effects on nearby Section 4(f) properties (see **Section 3.3**, *DOT Section 4(f) Resources and Evaluation*) and on visitor experiences at GCNRA. The noise analysis, documented in **Appendix H,** *Noise Study*, was closely coordinated with NPS.

As part of the noise analysis, a study area, or Initial Area of Investigation (IAI),[30] was defined (see **Figure 3-1**). All three airports (Halls Crossing, Bullfrog Basin, and Cal Black Memorial) were included in the IAI because all three airports contribute (or contributed) to aircraft noise in GCNRA. The IAI, in accordance with FAA's 2007 guidance, was determined by identifying the loudest aircraft that operates at the Cal Black Memorial Airport and flies at an altitude of approximately 10,000 feet above ground level or higher. For Cal Black Memorial Airport, the Cessna Citation (CJ3), which operates at the Airport once or twice per month, is the loudest aircraft. A circle was created around the Airport that shows the area within which the CJ3 operates until reaching an altitude of 10,000 feet. This same circle approach was then also applied to the closed Halls Crossing Airport and the combined area was used to identify the IAI.[31] A grid analysis, using one nautical mile separation among 1,255 points within the IAI, was used to calculate differences in noise impact between the No Action and With Project scenarios.

Using the IAI as an area of analysis, the FAA, in cooperation with NPS, conducted a noise evaluation. The evaluation of aircraft noise considered in preparing the Draft Supplemental EIS included the following:

- Conduct of sound level measurements
- Preparation of a revised Standard Noise Analysis
- Preparation of a Supplemental Noise Analysis using Supplemental Noise Metrics
- Conduct of visitor experience surveys

[30] The Project Area is identified as the Initial Area of Investigation (IAI) in the Noise Study (see **Appendix H**, *Noise Study*). Designation of the IAI boundary defines the area to be analyzed for potential noise effects, according to FAA's 2007 Guidance for Park-Related Supplemental Noise Studies, (see **Appendix I**, *FAA Guidance for Park-Related Supplemental Noise Studies*).

[31] Note: whether or not the CJ3 operated at Halls Crossing Airport, it was used in identifying the IAI to maintain consistency.

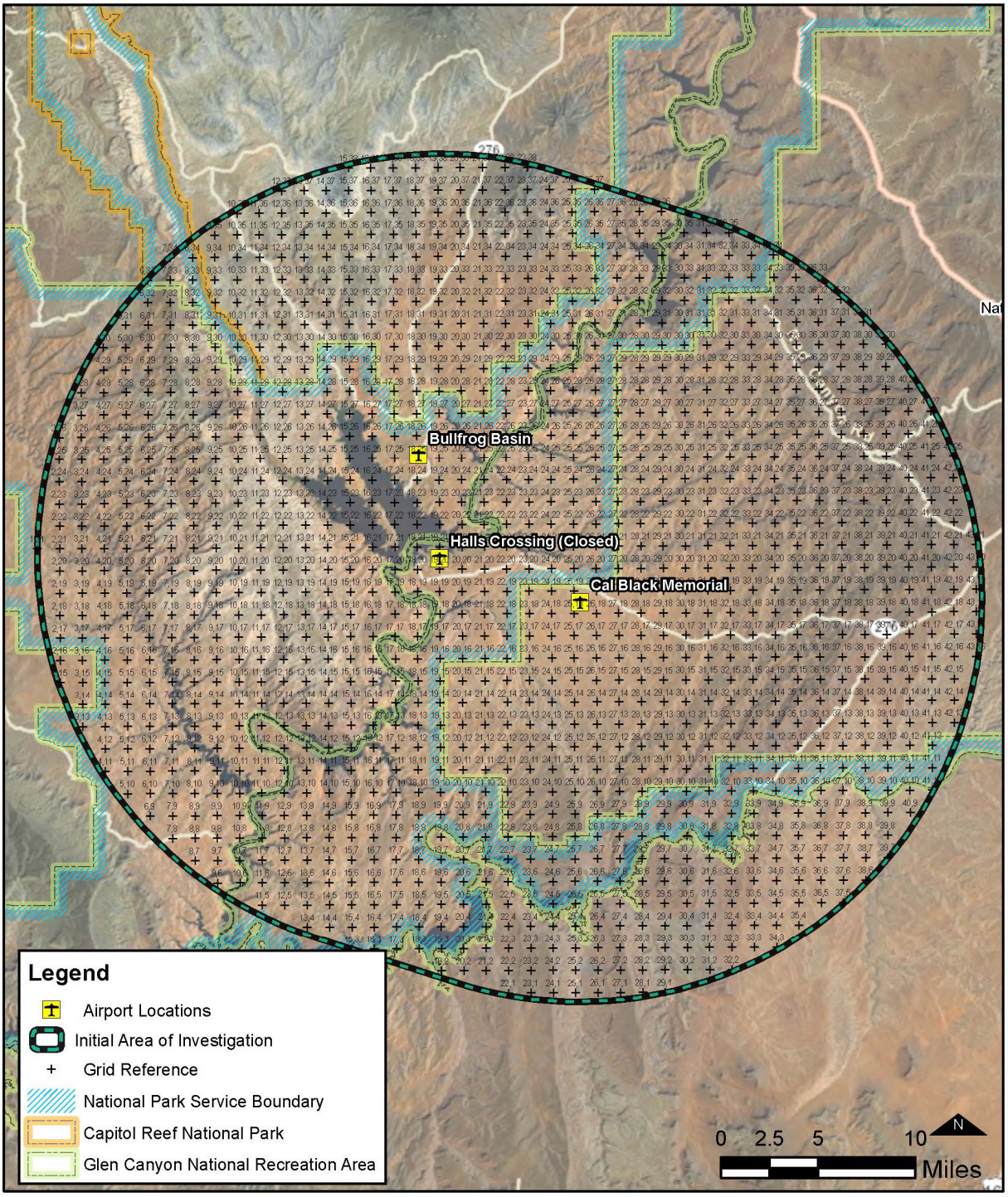

Figure 3-1 Initial Area of Investigation

Service Layer Credits: Copyright:© 2013 Esri, DeLorme, NAVTEQ, TomTom
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

3.2.1 Sound Level Measurements

According to the FAA's Guidance for Park-Related Supplemental Noise Studies (2007), one of the first steps in conducting a noise analysis is to identify the "existing ambient" level of noise, which is used in determining potential noise impacts from implementation of a proposed project (the construction of the Cal Black Memorial Airport and the closure of the old Halls Crossing Airport). The existing ambient is usually identified through the conduct of sound level measurements at specific locations. Two measurement efforts were conducted for this project: one conducted in 1998 and the other in 2010.

In 1998, the FAA, in consultation with the NPS, selected seven measurement sites, all of which were deliberately located away from areas that experience higher human-related noise (i.e., areas near high activity parts of Lake Powell were avoided). In 2010, measurements at sites relatively close to the 1998 sites were collected to augment data previously collected. Aircraft operations at Cal Black Memorial Airport (and Bullfrog Basin Airport) are subject to seasonal activity and are busiest during summer holiday weekends. Therefore, to capture a higher number of aircraft operations during the monitoring period, noise monitoring in GCNRA occurred from August 24, 2010 through October 9, 2010 (which includes Labor Day weekend, a very busy visitor period for GCNRA). Five of the seven locations where monitoring was conducted are located within GCNRA; however, as previously mentioned, none of those sites were on the navigable portions of Lake Powell with higher background noise levels due to boating and other recreational activities. As such, the noise monitoring data did not factor in the areas of higher ambient noise levels that occur on and around the lake, thereby making the average ambient noise levels generally more conservative. As such, the noise monitoring data did not factor in the areas of higher ambient noise levels that occur on and around the lake, thereby making the average ambient noise levels generally more conservative.

The ambient sound level at each site was identified using the measured Percentile Noise Level (Ln). Percentile Noise Level is the noise level exceeded for specified percentages (n) of the time (e.g., Ln represents the sound level exceeded n% of the time). L50 was selected to identify the existing median ambient for GCNRA, as it represents the sound that is exceeded half of the time.[32] Further, the environment was characterized in concert with NPS General Management Zones[33] (see **Figure 2-2**). NPS General Management Zones are described in more detail in **Section 2.3**, *NPS General Management Plan Zoning* and in **Section 3.3.2.1**, *Glen Canyon National Recreation Area (GCNRA)*. **Table 3-1** presents the L50 noise level for each measurement site, the respective NPS General Management Plan Zone, and land cover type.

[32] At the request of NPS, a supplemental natural ambient (Lnat) noise level was identified and analyzed for potential noise impacts at each measurement site (see appendix of Noise Study in **Appendix H**, *Noise Study*). The Lnat is a calculated noise metric that is intended to represent the natural ambient that would be present if there were no man-made sounds. This analysis is beyond what FAA would normally prepare, but was included based on coordination with NPS.

[33] *NPS Glen Canyon National Recreation Area Proposed General Management Plan, Wilderness Recommendation, Road Study Alternatives Final Environmental Impact Statement* (1979).

Table 3-1: Measured Ambient L50 Noise Levels at Each Monitoring Site and per Management Plan Zones

Measurement Site Number	Site Name	General Management Zone	Land Cover Type	Proposed Wilderness	L50 Existing Ambient
GLCA013 (BFA, #13)	Bullfrog Airstrip	Development	Developed, High Density	No	27
GLCA014 (HTR, #14)	Hole-in-Rock Road	BLM land (near to NPS Recreation & Resource Utilization)	Desert Shrub land	No	22
GLCA015 (CBA, #14)	Cal Black Airport	BLM land (near to NPS Recreation & Resource Utilization)	Developed, Low Density	No	22
GLCA016 (LKC, #16)	Lake Canyon	Recreation & Resource Utilization	Cliffs, Canyons	No	24
GLCA017 (MKC, #17)	Moqui Canyon	Natural	Cliffs, Canyons	Yes	22
GLCA018 (FGC, #18)	Forgotten Canyon	Natural	Cliffs, Canyons	Yes	23
GLCA019 (HNC, #19)	Hansen Creek	Recreation & Resource Utilization	Desert Shrub land	No	23

Source: Cal Black Memorial Airport Noise Analysis Report (2013), BridgeNet International, 2010 and discussion with NPS.

The L50 values were determined from the average of all the sites in each zone. Note that the value of the Natural Zone used was 22 dBA. Two of the measurement sizes were located in the Natural Zone and the average measured L50 was 22 and 23 dBA. To present a more conservative analysis, the lower value (L50 of 22) was used in the analysis to represent the Natural Zone.

The ambient noise levels in conjunction with the NPS General Management Plan Zones provided a means in analyzing potential noise impacts, specifically using supplemental noise metrics.

3.2.2 Standard Noise Analysis

1990 Final EIS Noise Analysis

The 1990 Final EIS included a standard noise analysis using the Day Night Average Sound Level (DNL). DNL is a 24-hour average noise level used to define the level of noise exposure. For the standard airport noise analysis, the primary noise criterion to describe the noise environment is the DNL. FAA's threshold of significant effects, per Order 1050.1E Appendix A.14.3 indicate that a significant effect occurs when noise sensitive land uses in the 65 DNL increase by 1.5 DNL due to a proposed project.

The 1990 Final EIS noise analysis considered annual aircraft operations at Cal Black Memorial Airport at 8,812 operations in 1992 and forecast growing operations to 23,113 in 2007. As noted in Chapter I of this Draft Supplemental EIS, current forecasts indicate that the actual annual operations at the Airport were 1,370 operations in 2010 and are forecast to increase to 1,738 annual operations by 2030. Thus, since the 1990 Final EIS, actual annual operations have decreased significantly (94% less than the 1990 Final EIS

predicted for 2007 and 90% less than 1992 actual operations). While the impact analysis prepared for this Draft Supplemental EIS cannot be compared directly with that used in the 1990 Final EIS, the significant reduction in total aircraft operations would imply that aircraft noise impacts are also substantially less than was predicted in the 1990 Final EIS.

Draft Supplemental EIS Noise Analysis

In comparing the No Action (Halls Crossing Airport) and With Project (Cal Black Memorial Airport) scenarios,[34] the noise study evaluated both standard airport noise contour analysis for existing (2010) and future (2030) conditions. The noise analysis used a twenty-year forecast for aviation activity to maintain consistency with the methodologies employed in the 1990 Final EIS. Additionally, cumulative impacts (which included overflights from airports outside of GCNRA) were assessed.

The current and future 65 DNL and greater noise contours for Cal Black Memorial Airport fall entirely on airport property, which is BLM land and is located outside of the GCNRA, whereas the closed Halls Crossing Airport noise contour fell on airport property that was entirely within GCNRA. While the change in noise on BLM land has increased by more than 1.5 DNL, this land is all used by the Airport (a compatible use with the noise exposure). Thus, according to standard noise analysis criteria, a significant noise level change has not occurred. However, the aircraft noise exposure that was once inside GCNRA, is now completely outside the GCNRA as measured by the 65 DNL.

3.2.3 Use of Supplemental Noise Metrics

According to FAA Order 1050.1E, the decision about whether to perform a supplemental noise analysis for a park is based on whether "natural quiet" is a recognized attribute at that location. In accordance with FAA's noise methodology for parks,[35] an initial noise screening assessment was conducted to determine the level of noise analysis, and if supplemental metrics would be required for the project. The noise screening assessment evaluated individual areas within the IAI that received noise increases and decreases as a result of the replacement of Halls Crossing Airport with Cal Black Memorial Airport. Ultimately, the conclusions of the initial screening analysis determined that the noise analysis warranted a more detailed assessment that included supplemental noise metrics. **Appendix H**, *Noise Study* describes that initial evaluation and the detailed supplemental analysis.

In coordination with the NPS and BLM, a Noise Analysis Protocol was drafted to guide the analysis. The protocol included the preparation of two categories of analysis: a standard airport noise contour analysis using DNL (which is documented in the previous section) and a supplemental metrics analysis. A grid analysis, using one nautical mile separation among 1,255 points within the IAI, was used to calculate the following supplemental metrics with their associated changes of exposure:

- +/- 3dB change of exposure for single event loudness (Lmax) for aircraft operations due to the opening of Cal Black Memorial Airport
- +/- 5 dB change of exposure for cumulative noise descriptions between existing ambient and 60 dB (using DNL and Leq[36])
- +/- 3 dB change of exposure for cumulative noise descriptors between 60-65 dB (DNL)
- Time Above Ambient (TAA), using existing ambient noise levels

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[34] As explained previously, Bullfrog Basin Airport is included in both scenarios.

[35] U.S. Department of Transportation, FAA, *Guidance on Procedures for Evaluating the Potential Noise Impacts of Airport Improvement Projects on National Parks and Other Sensitive Park Environments*, Version 1.0 (June 2007). (Herein referred to as FAA's *Sensitive Park Environment Noise Guidance*). (See **Appendix I**, *FAA Guidance for Park-Related Supplemental Noise Studies*).

[36] Leq (Equivalent Noise Level) is the sound level corresponding to a steady-state, A-weighted sound level containing the same total energy as a time-varying signal (noise that constantly changes over time) throughout a given sample period.

- Number of Events per day Above Ambient (NAA) using existing ambient noise levels

As previously mentioned, the supplemental metrics analysis provided a more detailed evaluation for determining potential noise impacts. **Table 3-2** summarizes existing and cumulative noise impacts by showing the number of grid points in the IAI (that are located either within or outside of GCNRA) that experienced increases or decreases in noise as a result of the operation of Cal Black Memorial Airport for noise metrics including DNL, Leq (Equivalent Noise Level), Lmax (Maximum Sound Level), TAA (Time Above Ambient), and NAA (Number of Events per Day Above Ambient).

While some new areas of GCNRA have experienced increased noise from the new Airport, a much greater number of locations have experienced a decrease in noise above ambient. Therefore, based on a noise above ambient analysis, the FAA concludes that closing the Halls Crossing Airport and relocating most of its flights to the replacement Cal Black Memorial Airport has overall reduced aircraft noise within GCNRA.

3.2.4 Summary of Noise Analysis Conclusions

The complete noise analysis in the Draft Supplemental EIS comprises a Standard Noise Analysis, a Supplemental Metrics Analysis, and a survey of actual visitor reaction to noise within GCNRA. While it was determined that the operation of Cal Black Memorial Airport has not resulted in a significant noise impact according to the Standard Noise Analysis (Order 1050.1E Appendix A.14.3), there is no FAA defined threshold of significance for either the Supplemental Metrics Analysis[37] or for the assessment of survey data.

The 1993 Tenth Circuit Court of Appeals decision noted that in the original EIS that "It is unclear what the FAA considered the threshold for significance." The purpose of this section is to document the issues that FAA considered in this Draft Supplemental EIS before rendering a conclusion about the significance of noise associated with the new airport (Cal Black Memorial Airport). The FAA's threshold of noise significance is defined in FAA Order 1050.1E, Appendix A 14.3 as:

> A significant noise impact would occur if analysis shows that the proposed action will cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same timeframe. For example, an increase from 63.5 dB to 65 dB is considered a significant impact. Special consideration needs to be given to the evaluation of the significance of noise impacts on noise sensitive areas within national parks, national wildlife refuges and historic sites, including traditional cultural properties. For example, the DNL 65 dB threshold does not adequately address the effects of noise on visitors to areas within a national park or national wildlife refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute.

In lieu of a specific parks threshold of significance, the FAA considered a number of issues. According to the President's Council on Environmental Quality (CEQ) regulations, the determination of the significance of an action's effects is a function of both *context* and *intensity*. Since there is no specific FAA threshold of significance for noise over national parks, the context and intensity of each action must be considered separately before rendering a conclusion. In preparing this Draft Supplemental EIS, the FAA considered the definition of significance as listed in the CEQ regulations (40 CFR 1508.27):

> Context: This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

[37] "…[S]upplemental noise analysis is not, by itself, a measure of adverse aircraft noise or significant aircraft noise impact." (U.S. Department of Transportation, Federal Aviation Administration, *Environmental Impacts: Policies and Procedures*, Order 1050.1E, CHG 1 (March 20, 2006), Appendix A., 14.5g).

Intensity: This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
2. The degree to which the proposed action affects public health or safety.
3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

This chapter and associated appendix (**Appendix H**, *Noise Study*) disclose the noise effects that the operation of Cal Black Memorial Airport has had on GCNRA. Among the issues considered relative to context and intensity are:

- The old airport (Halls Crossing Airport) was located entirely in GCNRA. Thus, the most notable noise impacts associated with Halls Crossing Airport occurred within GCNRA. The 65 DNL and greater aircraft noise contours were completely within the airport property with lower levels of aircraft noise extending within the GCNRA.
- The new Airport is outside the park. On average, 2 arrivals and 2 departures (4 operations) occur per day. In its peak year, Cal Black Memorial Airport served 8 operations a day (4 arrivals and 4 departures). Thus, any actual or perceived disruptions during an average day are infrequent.
- The 1990 Final EIS anticipated that by 2005, Cal Black Memorial Airport would serve 24,100 annual aircraft operations. In 2005, that airport served only 1,754 operations. Thus, actual aircraft noise associated with the new airport, relative to what had been predicted in the 1990 Final EIS, is substantially less.
- Based on the noise impact analysis prepared for the Draft Supplemental EIS, in general, there are less areas within the park that are exposed to aircraft-related noise than would have occurred had the old airport remained open and operational:
    - More areas in the park experience a decrease in noise as measured in DNL.[38]
    - Supplemental metrics, such as Leq, TAA, and NAA show similar conditions as the DNL – that a greater number of points in GCNRA have experienced decreased noise with the new airport (see **Table 3-2** for noise from the individual airports as well as cumulatively with enroute flights).
    - Only relative to the maximum sound level (Lmax) would there be more points in the park exposed to changes in sound level increases relative to the No Action when examining

[38] Note: Day-night average sound level is now referred to as DNL. At the time of the 1990 Final EIS, it was referred to as Ldn.

noise from the individual airports. As shown in **Table 3-2**, 142 points experience an increased Lmax, with 125 points experiencing a decreased Lmax due to Cal Black Memorial Airport.

- When considering the cumulative noise (noise from the individual airports, plus the enroute overflights), there are less points experiencing a change of exposure Lmax increase (81 points) versus a decrease (125 points); thus, cumulatively, less areas experience an increase in peak sound levels with Cal Black Memorial Airport.

- While there are new areas of the park that have been exposed to noise associated with the new airport location, these are of relatively low intensity sound levels relative to areas closer to the new or old airports.
- Visitor reaction captured in the on-site survey identified nominal concern with regard to aircraft noise exposure (See **Appendix G**, *Visitor Survey*, of this Draft Supplemental EIS):
  - Unless prompted, no survey respondents noted aircraft exposure as an annoyance.
  - When prompted, three-quarters of respondents reported hearing aircraft during their stay (72.5%), 44% reported hearing low-flying aircraft (the type of interest for Cal Black Memorial Airport operations), and 41.2% reported hearing high-flying aircraft (such as enroute activity considered in the cumulative impact analysis).
  - When prompted, only 4.8% reported even the slightest degree of annoyance with aircraft noise (although 72.5% heard aircraft), and the percentage of those expressing moderate to extreme annoyance was only 2.6% (± 1.4%).
  - Of the 358 respondents who answered a question about overflight experience while backcountry hiking, 24 (6.7%) had done some backcountry hiking. Of these hikers, only 7 (29.2%) reported hearing aircraft while they were in the backcountry. And of those 7, three (42.9%) reported being annoyed by hearing the aircraft, although only 1 reported being moderately or more annoyed.
  - 75.1% of the respondents noted that natural quiet was a very important reason why visitors came to Glen Canyon. Only 10 of 358 respondents (2.8%) reported even the slightest degree of interference by aircraft noise, although 2 reported extreme interference.
- The Airport has operated for over two decades with few complaints about aircraft noise exposure in the park. Thus, controversy, as defined in Order 5050.4B (paragraph 9i) does not appear to be present.
- Because in general the effects would be less to the park, no effects on public health or safety could be identified. The Lmax effects of the individual airports would not represent an effect on health or safety, as such effects would only occur at sustained high sound levels. The TAA analysis shows that the noise durations are short.
- No other measureable effects were identified that were not disclosed in the 1990 Final EIS/Record of Decision.

Based on the consideration of context and intensity, the FAA has determined that the noise effects are not significant.

Table 3-2: Noise Analysis Supplemental Metrics Results for Existing (2010) and Future (2030) Conditions

	Change of Exposure - Existing Conditions (2010)									
	DNL		Leq		Lmax		TAA		NAA	
	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease
GCNRA	3	23	3	27	142	125	6	51	0	70
Outside Park	29	0	36	0	287	35	33	0	3	2

	Change of Exposure - Future Conditions (2030)									
	DNL		Leq		Lmax		TAA		NAA	
	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease
GCNRA	3	27	3	27	142	125	6	71	1	77
Outside Park	32	0	50	2	287	35	45	5	33	5

	Change of Exposure - CUMULATIVE (with overflights) Existing Conditions (2010)									
	DNL		Leq		Lmax		TAA		NAA	
	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease
GCNRA	1	5	1	8	81	125	6	52	0	42
Outside Park	4	0	12	0	219	29	33	0	3	2

	Change of Exposure - CUMULATIVE (with overflights) Future Conditions (2030)									
	DNL		Leq		Lmax		TAA		NAA	
	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease	Increase	Decrease
GCNRA	1	5	1	8	81	125	6	72	1	77
Outside Park	5	0	12	0	219	29	46	5	33	5

Source: Cal Black Memorial Airport Noise Analysis Report (2013), BridgeNet International, 2010 and discussion with NPS.

Tables show the number of grid points in the IAI that experienced changes in noise levels as defined below:

- DNL (Day Night Average Sound Level) - noise experienced during an entire (24-hour) day (average). Change of exposure for DNL shows increases or decreases in noise of 5 dBA or greater.
- LEQ (Equivalent Noise Level) - sound level corresponding to a steady-state, A-weighted sound level containing the same total energy as a time-varying signal (noise that constantly changes over time) throughout a given sample period. Change of exposure for LEQ shows increases or decreases in noise of 5 dBA or greater.
- Lmax (Maximum Sound Level) - loudest sound level reached during a noise event. Change of exposure in Lmax show increases and decreases of 3 dB or greater. Note: There would be no change in Lmax conditions between 2010 and 2030, as the noisiest aircraft assumed for the Lmax analysis (Cessna Caravan 208) would continue to operate in both timeframes.
- TAA (Time Above Ambient) - total time in minutes that aircraft noise exceeds existing
- Management Zone ambient noise levels in a 24-hour period. Change of exposure in TAA shows a decrease or increase in 5 minutes of time above ambient.
- NAA (Number of Events/day Above Ambient) - number of events per day that generate a noise level above that ambient. Change of exposure for NAA shows increases or decreases of two or more events.

3.3 DOT Section 4(f) Resources and Evaluation

This section constitutes the Section 4(f) Evaluation, which describes the potential impacts of the continued operation of Cal Black Memorial Airport on lands protected under Section 4(f) of the Department of Transportation Act of 1966 [recodified at 49 U.S.C. § 303(c)] (herein referred to as "Section 4(f)"). Lands considered potentially eligible as Section 4(f) include publicly-owned parks, recreation areas, and wildlife and waterfowl refuges of national, state, or local significance, and public or private historic sites of national, state, or local significance.

3.3.1 Background and Section 4(f) Analysis Methods

The purpose of this Draft Section 4(f) Evaluation is to identify and evaluate the potential noise-related impacts to Section 4(f) resources that resulted from implementation of the proposed project (the operation of the Cal Black Memorial Airport and the closure of the old Halls Crossing Airport). Section 4(f) of the Department of Transportation Act of (recodified at 49 U.S.C. § 303(c)) provides for the protection of publicly-owned parks, recreation areas, and wildlife and waterfowl refuges of national, state, or local significance, and public or private historic sites of national, state, or local significance. The Act requires that U.S. Department of Transportation agencies, including the FAA, "not approve the use of land from a significant publicly owned park, recreation area (including school play grounds and/or ball fields), wildlife and waterfowl refuge, or any significant historic site unless a determination is made that:

- There is no feasible and prudent alternative to the use of the land; and,
- The action includes all possible planning to minimize harm to the property resulting from such use."

In addition to meeting Section 4(f) requirements, properties listed on or eligible for listing on the National Register of Historic Places (NRHP) must also be addressed in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966.

As was noted in the 1990 Final EIS, the land upon which Cal Black Memorial Airport was to be built is land owned by the BLM which FAA deemed Section 4(f) lands because parts of the land are used for recreational purposes. The 1990 Final EIS states:

> Alternatives B and D are on land which is designated and administered by the BLM not solely for recreational purposes, but rather for multiple uses. BLM has informed FAA by a letter dated November 14, 1989, that it does not consider 4(f) to be applicable to this land. The de facto use of this land is similar, however, to the use of National Park Service land less than two miles away… Since the de facto use of the BLM land is largely recreational, FAA has decided to treat the taking of land for Alternatives B and D as being subject to 4(f).

In the 1990 Final EIS and Record of Decision, the FAA determined that there were no other prudent and feasible alternatives to the use of these public recreational lands for the construction and operation of the Airport and that all steps had been taken to minimize harm. As the Airport has been in operation for over two decades, the past physical use (direct effects) occurred when the Airport was built. Further, direct effects were not the subject of the Court remand; the remand focused on the noise effects of the airport that had been built. This Draft Supplemental EIS examines the noise-related, indirect/constructive effects associated with the operation of the Airport on lands subject to Section 4(f).

Airport development has the potential to "use" Section 4(f) resources physically or constructively. A constructive use would result when the proposed project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. Substantial impairment would occur only when the protected activities, features, or attributes of the property are substantially diminished. The term "substantially diminished" means that the value of the resource, in terms of its Section 4(f) purpose and significance, is substantially reduced or lost. FAA experience shows that noise impacts

have the potential to cause airport-related constructive use of Section 4(f) resources.[39] Each Section 4(f) resource was evaluated for constructive uses associated with the continued operation of the new Cal Black Memorial Airport, when compared to what might have been the condition with the old Halls Crossing Airport.

For most airport projects, the FAA uses its standard airport noise evaluation for purposes of considering constructive use effects on Section 4(f) resources. FAA Order 1050.1E, Appendix A, Section 14.3 notes that an action would have a significant project effect if the project increases noise by 1.5 DNL (dBA) to a noise sensitive use within the 65 DNL or greater noise exposure. In addition, the Order discusses special consideration needs to be given to noise sensitive areas such as national parks. Detailed information on such special considerations is contained in **Section 3.2.4**, *Summary of Noise Analysis Conclusions*. The following subsections discuss whether the standard airport noise criteria apply to the identified Section 4(f) resources and under which circumstances supplemental noise metrics were used.

3.3.2 Identification and Description of Section 4(f) Properties

To determine the applicability of Section 4(f) to resources within the Project Area and the type of analysis needed for the resources, an inventory and evaluation of parks/refuges and historic properties were conducted. Using the Initial Area of Investigation (IAI) discussed in the prior **Section 3.2** *Noise Analysis*, a review was conducted of lands within the IAI. Virtually all of the land in the Project Area is controlled by the NPS and/or the BLM, and thus is public land, much of which is used for recreational purposes. The Glen Canyon National Recreation Area (GCNRA) is administered by the NPS, while the BLM administers public land within the Escalante Resource and other lands adjoining GCNRA. GCNRA abuts Canyonlands National Park, Capitol Reef National Park (CRNP), Rainbow Bridge National Monument, and Grand Canyon National Park. Of these parks that abut GCNRA, only GCNRA and CRNP are within the Project Area.

Resources that are within the Project Area[40] that are considered potentially eligible for consideration as Section 4(f) include:

1. Glen Canyon National Recreation Area (GCNRA), a recreational/park use;
2. Capitol Reef National Park (CRNP), a recreational/park use, which is adjacent to GCNRA;
3. Hole-In-The Rock Trail/Road which is located in GCNRA, a historic site; and
4. BLM lands containing Cal Black Memorial Airport and adjacent properties, containing some recreational uses.

The following sections describe these resources as well as the rationale used to determine which of the FAA's two noise evaluation criteria were applied to the various resources. Per FAA Order 1050.1E Appendix A6.2i FAR Part 150 land use compatibility guidance is used to consider noise effects, unless the property is located in a "quiet setting and the setting is a generally recognized feature or attribute of the site's significance" and "to the extent that the land uses specified bear relevance to the value, significance, and enjoyment of the land." The sites noted above and their land use values were identified based on a review of area maps and the resource plan documents of the NPS and BLM.

3.3.2.1 Glen Canyon National Recreation Area (GCNRA)

Glen Canyon, located on the Colorado Plateau, and Lake Powell, the nation's second largest manmade lake, comprise the main attractions at the park. The total area comprising GCNRA is approximately 1,255,000 acres. Having the distinction of being one of the most visited NPS units in the Colorado Plateau region, GCNRA has the most overnight stays in the entire National Park Service system. Visitation tripled

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[39] U.S. Department of Transportation, Federal Aviation Administration, *Environmental Impacts: Policies and Procedures*, Order 1050.1E, Change 1, (March 20, 2006), Appendix A., paragraph 6.2f.

[40] The Project Area is identified as the Initial Area of Investigation (IAI) in the Noise Study (see **Appendix H**, *Noise Study*). Designation of the IAI boundary defines the area to be analyzed for potential noise effects, according to FAA's 2007 Guidance for Park-Related Supplemental Noise Studies, (see **Appendix I**, *FAA Guidance for Park-Related Supplemental Noise Studies*).

from 1 million in 1975 to over 3 million in 1993. Since that time, visitation has decreased and ranges from 1.8 to 2.6 million visitors per year. [41]

With over 95 percent of the visitors to GCNRA accessing Lake Powell, water-oriented sports are the predominant recreation activities in the GCNRA. The remaining percentage of visitors visit the park with the purpose of hiking. Pleasure boating, water-skiing, swimming and beach camping are main summer activities. Sports fishing and concessionaire tour boat rides constitute major year-round activities. In addition to water activities, the area's recreational uses also include river running, hiking wilderness trails, four-wheel driving on backcountry roads, and hunting and trapping.

To determine compatibility of aircraft noise with parts of GCNRA, a review was conducted of the attributes and values used by NPS for parts of the recreation area. Within GCNRA, the NPS uses General Management Plan zoning designations (as shown in **Figure 2-2;** see **Section 2.3,** *NPS General Management Plan Zoning*) to specify the long-term allocation of the land and water resources of the recreation area:[42]

1. **Natural Zone** - covers about 668,670 acres, in which maintenance of isolation and natural processes while allowing grazing activities is the management strategy. The Natural Zone includes the recreation areas outstanding scenic resources, relatively undisturbed areas isolated and remote from the activities of man, or areas bordering on places with established land-use practices complementary to those of the Natural Zone. Recreational activities in this area include: Hunting, hiking, camping, picnicking, horseback riding, swimming, backpacking, canoeing, and kayaking.
2. **Recreation and Resource Utilization Zone** (557,890 acres) is characterized by maintenance of natural processes while allowing to the extent possible both mining and grazing. The RRU Zone consists of areas possessing somewhat less scenic value, greater susceptibility to the activities of man, potential or actual mineral resources, or value for utility rights-of-way or development. The permitted activities are the same as Natural Zone, but also include bicycling, scenic touring (auto, 4-wheel-drive, and boat), speed-boating, water skiing, fishing, sail-boating, houseboat touring, river rafting, riding trail-bikes, and dune-buggies. Note that according to the NPS General Management Plan, use of dunebuggies and trailbikes are restricted to designated areas.
3. **Lake**: The Lake Zone encompasses Lake Powell. The permitted activities are the same as the Recreation and Resource Utilization Zone.
4. **Cultural Zone** (25 acres) is land where the preservation, interpretation, and restoration of historic and archeological resources are the exclusive themes. Permitted recreational activities in this zone include interpretation of historic and archaeological features.
5. **Development Zone** (19,270 acres) is the area where the provision of visitor services and maintenance of facilities is practiced. Permitted recreational activities include bicycling, picnicking, horseback riding, swimming, fishing, trailer and motorhome camping, arts and crafts activities, outdoor resort activities, interpretive programs, riding trail-bikes, and dune-buggies.

According to the NPS General Management Plan (GMP), approximately 54% of GCNRA is designated as the Natural Zone, 45% is designated as the Recreation and Resource Utilization Zone (including Lake Powell), less than 2% is the Development Zone, and less than 1% is the Cultural Zone.

Because park uses in the Natural Zone and Cultural Zone might have an expectation of a quiet setting in line with stated GMP goals for solitude in backcountry areas, the approach for considering noise in these zones uses the 2007 *FAA Guidance for Park-Related Supplemental Noise Studies* that includes both the

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41 National Park Service Visitor Use Statistics, Glen Canyon NRA (https://irma.nps.gov/Stats/SSRSReports/Park%20Specific%20Reports/Annual%20Park%20Recreation%20Visitation%20Graph%20(1904%20-%20Last%20Calendar%20Year)?Park=GLCA)

42 U.S. Department of the Interior, National Park Service, *Glen Canyon National Recreation Area, Proposed General Management Plan, Wilderness Recommendation, Road Study Alternatives, Final Environmental Impact Statement* (1979). (Herein referred to as the NPS General Management Plan).

standard airport noise and supplemental metrics analysis noted in **Section 3.2,** *Noise Analysis*. The aircraft noise evaluation within the Recreation and Resource Utilization Zone (herein called Recreation/Resource Zone), Lake Zone, and Development Zone relies on the FAA's standard airport noise and land use compatibility guidelines (40 CFR Part 150, Table A) as some (but not all) active recreational activity may produce noise levels above ambient, and somewhat greater susceptibility to noise is possible. Under the Part 150 Land Use Compatibility guidance, active recreation is compatible with aircraft noise up to 75 DNL.

3.3.2.2 Capitol Reef National Park (CRNP)

CRNP, a NPS unit, is a 100-mile long, narrow park that preserves about 242,000 acres of land. CRNP connects to GCNRA on the northwestern boundary of GCNRA. The park, established in 1971, is open all year. It protects colorful canyons, ridges, buttes, and monoliths. About 75 miles of the long up-thrust called the Waterpocket Fold, a rugged spine extending from Thousand Lake Mountain to Lake Powell, is preserved within the park. "Capitol Reef" is the name of an especially rugged and spectacular segment of the Waterpocket Fold near the Fremont River. The area was named for a line of white domes and cliffs of Navajo Sandstone, each of which looks somewhat like the United States Capitol building, that run from the Fremont River to Pleasant Creek on the Waterpocket Fold.

The NPS Capital Reef Management Plan[43] notes the following management zones: a) Primitive (isolated landscapes remain in an essentially wild and undeveloped condition, with opportunities to experience wilderness solitude and natural quiet); b) Semi-Primitive (similar to the primitive zone, except that evidence of human activity is more pronounced); c) Threshold Zone (visitor activities accommodated and permit opportunities for solitude much of the year, except during peak season); d) Rural Developed Zone (moderately developed areas including park headquarters); e) Utility Corridor Zone; and f) Road Corridor Zones.

Approximately 7,200 acres of CRNP are located within the Project Area. Of the 1,255 grid points used in the noise analysis, seven (7) points on the very northern portion of the Project Area are located within CRNP, within the Primitive Zone. Therefore, the Section 4(f) Evaluation uses the 2007 *FAA Guidance for Park-Related Supplemental Noise Studies* supplemental metrics noted in **Section 3.2** to consider potential constructive use effects of Cal Black Memorial Airport.

3.3.2.3 BLM Lands at Cal Black Memorial Airport and Adjacent Lands

As noted earlier, when the 1990 Final EIS was prepared, the land upon which the Airport was built was considered by the FAA as Section 4(f) lands based on the 1987 Resource Management Plan.[44] FAA Order 1050.1E notes that when lands, such as BLM public lands, are being used for multiple purposes, the agency having jurisdiction over the lands should be consulted to determine whether the lands should be subject to Section 4(f). In 1990, the BLM indicated that lands near the then proposed site (based on the then RMP) were not Section 4(f); however, the FAA evaluated them as Section 4(f) lands. Since the 1990 Final EIS, the BLM has updated its Resource Management Plan (2008 Approved RMP), which was consulted for purposes of determining the uses of BLM lands, identifying criteria for consideration as Section 4(f) land, and classifying desired recreational values.

For the Draft Supplemental EIS, the FAA has determined that the BLM lands would be subject to Section 4(f) evaluation given the multiple uses of the land. Thus, the type of analysis that would be applicable to each of the BLM lands required a review of the characteristics and values associated with the various parts

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[43] U.S. Department of the Interior, National Park Service, *Final Environmental Impact Statement General Management Plan Development Concept Plan Capitol Reef National Park* (September 1998).

[44] U.S. Department of Transportation, Federal Aviation Administration, *1990 Final Environmental Impact Statement for Replacement Airport at Halls Crossing Final Environmental Impact Statement, San Juan County, Utah* (Washington, DC, May 1990, Page), 4.86.

of BLM lands to determine whether to use the Part 150 land use compatibility guidance or the 2007 *FAA Guidance for Park-Related Supplemental Noise Studies*.

A review of the BLM 2008 Approved RMP indicates that the Monticello Planning Area includes three BLM designated areas that are used for recreational purposes:

1) Lands noted as Special Recreation Management Areas (SRMAs) and Recreation Management Zones (RMZs); and

2) Wilderness Study Areas (WSAs);

3) Non-WSA areas with wilderness characteristics.

The BLM proposes to protect certain attributes of these lands that might make them eligible for consideration as Section 4(f) and subject to various sound level visitor expectations of quiet. The recreational goals of the Monticello Planning Area are "[t]o provide for multiple recreational uses of the public lands and to sustain a wide range of recreation opportunities and potential experiences for visitors and residents while supporting local economic stability and sustaining the recreation resource base and other sensitive resource values."[45] **Table 3-3** identifies how each BLM designated area was evaluated for the noise analysis for this Draft Supplemental EIS. The paragraphs following the table discuss the characteristics of these three types of areas and provide justification for the assigned noise analysis methods.

Table 3-3: Noise Analysis for BLM Lands

BLM Land Use	Noise Reference	FAA Noise Criteria
1) Special Recreation Management Area (SRMA)	Non-motorized recreation with activities such as hiking, backpacking, canyoneering, mountain biking, horseback riding	Standard airport noise criteria (65 DNL)
Recreation Management Zone (RMZ)		Standard airport noise criteria (65 DNL)
2) Wilderness Study Areas (WSAs)	Protection of visual resources and is closed to off-highway vehicles	Standard airport noise criteria (65 DNL)
3) Non-WSA areas with wilderness characteristics	BLM natural areas will be managed to protect, preserve, and maintain values of primitive recreation, the appearance of naturalness and solitude	Standard airport noise criteria and supplemental metrics

The 2008 Approved RMP states the following with regard to recreation:

> The Approved RMP responds to recreation issues by providing Special Recreation Management Areas (SRMAs) and Recreation Management Zones (RMZs) to manage visitors. These visitors engage in a variety of non-motorized and motorized recreation activities, many of which conflict with each other. Recreational activities include camping, scenic driving, enjoying natural and cultural features, hiking, backpacking, canyoneering, mountain biking, horseback riding, hunting, rock climbing, BASE jumping, boating (rafting, canoeing, and kayaking), four-wheel driving, rock crawling, ATVing, and dirt biking. (Page 29)

One Special Recreation Management Area (Cedar Mesa) is located in the Project Area of this Draft Supplemental EIS. No reference is made in the BLM's 2008 Approved RMP concerning protecting these lands relative to solitude or to characteristics associated with a quiet setting. Therefore, the evaluation criteria used for purposes of this Section 4(f) evaluation rely on the standard airport noise criteria for Special Recreation Management Areas.

[45] Bureau of Land Management Monticello Field Office, *Record of Decision and Approved Resource Management Plan* (November 2008).

The 2008 Approved RMP identifies 13 WSAs[46] within the Monticello Planning Area and notes that the management decision for the WSA is to "Manage 13 WSAs (389,444 acres) as VRM Class I[47] and is closed to OHV [Off-Highway Vehicle] use (with exception of 0.08 miles of a way in Fish Creek WSA to access the Moon House ruin)." Within the Project Area of this Draft Supplemental EIS there are two WSAs (Mancos Mesa WSA, which is noted as primitive recreation; and Little Rockies WSA). Based on the goals for the WSAs, soundscape is not indicated as a value that BLM manages for protection. Therefore, for purposes of this Draft Supplemental EIS, the standard airport noise criteria was applied (reliant on the 65 DNL and greater sound level) for WSA areas under Section 4(f). BLM concurred with this approach.

Relative to non-WSA wilderness areas, the 2008 Approved RMP states:

> In future references, lands managed in the Approved RMP as non-WSA lands with wilderness characteristics will be referred to as BLM natural areas… Wilderness Areas and Wilderness Study Areas are formal designations that are managed in a prescribed manner. To avoid confusing these official designations with discretionary agency decisions, BLM has chosen a new reference to distinguish between formal designations (e.g., Wilderness Areas) and a discretionary management category (BLM natural areas). According to the Approved RMP, BLM natural areas will be managed to protect, preserve, and maintain values of primitive recreation, the appearance of naturalness and solitude. (Page 38)

While there are 88,871 acres of land with wilderness characteristics within the Monticello Planning Area, there are five areas designated as non-WSA lands with wilderness characteristics that are noted for protection, preservation, and maintenance of characteristics including "solitude." Within the Project Area, three areas noted as non-WSA wilderness areas are: 1) Nokai Dome West, which is approximately 1 mile west of Cal Black Memorial Airport; 2) Mancos Mesa, which is located about 7 miles northeast of the Airport; and 3) Nokai Dome East, which is about 5 miles southeast of the Airport. Given BLM's recreational attribute protection values for the non-WSA wilderness areas, the FAA has applied its quiet setting noise evaluation approach (2007 *FAA Guidance for Park-Related Supplemental Noise Studies)* that includes the standard airport noise criteria as well as the supplemental metrics noted earlier for GCNRA.

In summary, in **Section 3.2**, *Noise Analysis*, the discussion of noise presents the standard airport noise evaluation as well as the supplemental noise metrics. While the standard noise analysis would apply to all of the BLM lands for Section 4(f) purposes, only one portion would rely on the supplemental metrics: the non-WSA wilderness areas due to the BLM's protection of these lands relative to solitude.

3.3.2.4 Hole-In-The Rock (HITR) Trail/Road [Historic Site]

The history of the European settlement of the area began with the Dominiguez-Escalante party passage through the area in 1776. Part of the Hole-in-the-Rock Trail is located about three miles south of Cal Black Memorial Airport. The trail and road are a historical reminder of the Mormon missionaries and their influence in the area. The Hole-in-the-Rock Road closely follows the route of the 1879 Hole-in-the-Rock trek, an epic journey in which members of The Church of Jesus Christ of Latter-day Saints (LDS, also known as Mormons), established a more direct route across the Colorado River to the southeastern corner of Utah to settle at Fort Bluff along the San Juan River.

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[46] FAA Order 1050.1E Appendix A.6.2b refers to "National wilderness areas may serve similar purposes and shall be considered subject to section 4(f) unless the controlling agency specifically determines that for section 4(f) purposes the lands are not being used." (U.S. Department of Transportation, Federal Aviation Administration, *Environmental Impacts: Policies and Procedures*, Order 1050.1E, CHG 1 (March 20, 2006), Appendix A., 6.2b).

[47] The RMP establishes Visual Resource Management (VRM) class. VRM Class I objectives are the most restrictive and protective of these resources. These properties are managed for protection of visual resources. There is an expectation from visitors that these scenic qualities of a primarily pristine and undeveloped landscape will be maintained through appropriate management.

There are two sites on the National Register of Historic Places associated with the trek that are located along Hole-in-the-Rock Road (Dance Hall Rock and the Hole-in-the-Rock). Dance Hall Rock is located 41 miles down the road from State Route 12 and is where pioneers held dances in its natural amphitheater to socialize and keep spirits high. The actual "Hole-in-the-Rock" is 61 miles down the road from State Route 12 and is where pioneers engineered a passage to the Colorado River down an almost 1,000-foot escarpment.

The Hole-in-the-Rock Road, a State Scenic Backway, is located in Garfield and Kane Counties, Utah, on lands managed by BLM and NPS. The road is a gravel and dirt road accessed via Utah State Route 12 between the towns of Escalante and Boulder, Utah. Recreation destinations along the Hole-in-the-Rock Road include: Devil's Garden, Dinosaur Tracks, Harris Wash Trailhead, Dry Fork Trailhead, Batty Pass Caves, Egypt slot canyons, Twenty-five Mile wash, Coyote Gulch, Fifty-mile Wash, and Fifty-mile Mountain Trailhead. In addition, the road provides access to many undeveloped routes leading into the Escalante Canyons within Grand Staircase-Escalante National Monument and GCNRA.

According to BLM documentation,[48] the entire Hole-in-the-Rock Trail on both sides of the Colorado River, as well as the associated historic Expedition places, may be evaluated as eligible to the National Register of Historic Places as a "traditional cultural property (TCP)." A TCP is listed on or eligible for the National Register because of its association with the cultural practices or beliefs of a living community that are (1) rooted in that community's history, and (2) important in maintaining the cultural identity of the community.

Portions of the trail are located within the NPS Cultural Zone of GCNRA which does not mention solitude or indicate that a quiet setting is an expectation. However, portions of the trail within BLM lands are within the BLM zones referred to previously as non-WSA wilderness area which protects for solitude. Therefore, for effects to the trail, the Section 4(f) evaluation relies on the 2007 *FAA Guidance for Park-Related Supplemental Noise Studies* supplemental metrics.

3.3.3 Feasible and Prudent Alternatives

Projects requiring the use of Section 4(f) resources will not be approved by the FAA unless there is no feasible and prudent alternative to the use of such land, and such projects include all possible planning to minimize harm resulting from the use. The Cal Black Memorial Airport has been built and in operation for over two decades. This analysis was prepared to disclose the effects of the new airport in accordance with the Court remand. **Chapter 1** discusses the Court remand. Effects of the new airport (Cal Black Memorial Airport) were compared to the No Action (which assumes a theoretical condition of the old Halls Crossing Airport remaining open today and in the future).

3.3.4 Environmental Consequences

The following sections provide a review of potential impacts to the identified Section 4(f) resources within the Project Area.

3.3.4.1 Noise Analysis

Section 3.2, *Noise Analysis*, of this Draft Supplemental EIS presents the noise effects associated with the operation of the Cal Black Memorial Airport. The FAA coordinated extensively with the NPS in preparing the noise analysis. These noise analyses were conducted for existing (2010)[49] and future (2030) conditions, as well as for individual airports [Halls Crossing (now closed), Bullfrog Basin, and Cal Black Memorial Airports] and for cumulative impacts (which included overflights from airports outside of GCNRA). The

[48] Bureau of Land Management, *Programmatic EA for Organized Group Activities along Hole in the Rock Road* (March 2012).

[49] 2010 remains applicable and is used as the existing baseline condition because there are a very low number of operations and a very slow growth (if any) in operations. Therefore, the year 2010 provides a valid baseline of operational data.

noise analysis is summarized in **Table 3-2** showing the total Change of Exposure (COE) for DNL (the standard airport noise metric), and the supplemental metrics [Leq (Equivalent Noise Level)), Lmax (maximum sound level), TAA (Time Above Ambient), and NAA (Number of Events per Day Above Ambient) in accordance with the FAA's noise methodology for parks/quiet settings].[50] The noise analyses for the identified Section 4(f) resources within the Project Area are discussed below.

National Park Service Lands (Glen Canyon National Recreation Area, Capitol Reef National Park, and Hole-in-the-Rock Trail within GCNRA)

The total number of grid points evaluated in the Project Area, as documented in **Appendix H**, *Noise Study*, was 1,255 points. **Tables 3-4 and 3-5** summarize the COE in each GCNRA management zone relative to each of these metrics; COE refers to the change in noise for the metric for the Cal Black Memorial Airport when compared to the No Action (Halls Crossing Airport). **Table 3-4** summarizes COE for individual airports within GCNRA for existing and future conditions, while **Table 3-5** summarizes COE for cumulative impacts for existing and future conditions. The shaded cells indicate those zones where the new airport has increased the number of grid points that have experienced an increase in noise. **Table 3-4** shows the noise effects of the three individual airports located in the Project Area, whereas the **Table 3-5** results show the cumulative noise when factoring in aircraft that overfly the Project Area but do not operate at Halls Crossing, Cal Black Memorial, or Bull Frog Airport. The conclusions concerning the Cal Black Memorial Airport effects on Section 4(f) are the same when factoring in the cumulative overflight effects.

The standard airport noise analysis shows that Cal Black Memorial Airport does not currently produce significant aircraft noise exposure over GCNRA or CRNP and forecast activity would not be expected to generate such levels as measured by the 65 DNL. Previously, the 65 DNL contour occurred over GCNRA land at Halls Crossing Airport. While a change of exposure of 1.5 DNL within the 65 DNL has occurred with the closure of Halls Crossing Airport and transfer of activity to Cal Black Memorial Airport, all areas within the 65 DNL and greater noise contour are now over airport lands which are outside of the GCNRA.

The supplemental noise analysis for quiet park settings is also shown in the upper part of **Table 3-4**. That table identifies the number of grid points that have experienced decreases and increases in noise. Within the Natural Zone, the zone with a designation of "maintenance of isolation and natural processes," NPS parkland has experienced a decrease of six (6) points, with only one point experiencing an increase today (a net reduction of 5 points in GCNRA). By 2030, nine (9) points would experience a decrease with the new airport, while one point would experience an increase (a net reduction in eight points within NPS parkland experiencing reduced noise). From this analysis, FAA has concluded that a larger area of the NPS parkland has experienced a decrease in noise with Cal Black Memorial Airport, when measuring the effect using the DNL.

The middle part of **Table 3-4** shows the COE using the supplemental metric Lmax. Three zones have and are expected to continue to experience an increased number of grid points that have an increase in Lmax due to Cal Black Memorial Airport (Lake, Recreation/Resource, and Outside the Park). As is noted, the Lmax results are the same for the existing and future condition, as the same aircraft type produces the same maximum sound level. In the Natural Zone, the Cal Black Memorial Airport has resulted in 81 points with a decreased Lmax, with 71 points experiencing an increase. Thus, 10 points have and are expected to continue to experience a decrease in noise due to the replacement Airport as measured by Lmax.

The bottom part of **Table 3-4** contrasts the COE using three supplemental metrics of Leq, TAA, and NAA. Only areas outside NPS parkland would experience an increase in the number of grid points that would experience an increase in noise with the Cal Black Memorial Airport. The Natural Zone has experienced nine (9) grid points with a 5 Leq decrease, with one (1) grid point experiencing an increase in existing conditions (2010). Similarly, nine (9) grid points experienced a 5-minute decrease in NAA whereas three (3) points experienced a 5-minute increase. The Natural Zone also experienced five (5) grid points with a

[50] U.S. Department of Transportation, Federal Aviation Administration, *Guidance on Procedures for Evaluating the Potential Noise Impacts of Airport Improvement Projects on National Parks and Other Sensitive Park Environments*, Version 1.0 (June 2007). (Herein referred to as FAA's *Sensitive Park Environment Noise Guidance*).

decrease of 2 events above the L50 ambient, with no (0) grid points in this zone experiencing an increase. Similar results occur for projected (2030) conditions. Similar to the DNL analysis, the FAA has concluded based on the grid point analysis that while new or different areas experience an increase in noise due to the replacement airport, the total area of NPS parkland has experienced a decrease in noise and is expected to continue with less effects with Cal Black Memorial Airport.

None of the grid points in CRNP were identified as experiencing a COE under the various metrics/criteria discussed in the noise analysis. Thus, the primary focus of the evaluation of NPS park land effects are on COE within GCNRA.

BLM Lands including Portions of Hole-in-the-Rock Trail on BLM Lands

The FAA's standard aircraft noise evaluation was applied to effects of Cal Black Memorial Airport on two land management areas of BLM lands (WSAs and SRMAs). None of these BLM WSA or SRMA lands are exposed to 65 DNL or greater noise levels, nor would they be expected to be exposed to those noise levels in the future.

Portions of Hole-in-the-Rock Trail fall on BLM property. This trail spans the Project Area from east to west, and generally falls on non-WSA wilderness area or SRMA. To be conservative, the consideration of the noise effects was done in the context of the non-WSA wilderness areas. The non-WSA wilderness area was evaluated relative to the quiet setting, using the supplemental metrics discussed in **Section 3.2**, *Noise Analysis*.

The supplemental metrics recommended by the FAA's 2007 guidance were used. BLM non-WSA wilderness areas have experienced an increased impact relative to the COE for Lmax and the other metrics such as TAA and NAA, both for the individual airports as well as the cumulative analysis with overflights. For instance, relative to the individual airports using the Lmax noise metric, 25 points within the BLM non-WSA wilderness area experienced a decreased noise level with Cal Black Memorial Airport, and 258 points experienced an increased COE, a net increase of 233 points experiencing an increased COE. Of the 258 grid points experiencing an increased COE, 97 points experienced the change of 3-4.9 dBA, 62 points experienced 5-9.9 dBA, and 99 points experienced a 10 dBA or greater change.

Summary and Conclusion

Based on the noise effects, the operation of Cal Black Memorial Airport has not and is not expected to result in a constructive use of Section 4(f) lands. Relative to GCNRA, a smaller amount of the parkland has experienced aircraft noise since the opening of Cal Black Memorial Airport. No land within CRNP experienced a COE above the reported thresholds. The supplemental metrics, coupled with the visitor survey, does not indicate that the actual noise experienced has materially affected the access and/or use of these recreational lands.

Relative to BLM lands, the reduction in aircraft noise to a substantial portion of GCNRA by replacement of the airport outside the GCNRA has resulted in increases in aircraft noise over BLM lands. FAA has found that a constructive use effect would not be expected to occur to WSA or SRMA managed lands as the noise exposure does not appear to be high enough to have created a substantial impairment. Increased noise to non-WSA wilderness lands have occurred and are expected to continue with the continued operation of Cal Black Memorial Airport. However, FAA has concluded that these effects do not rise to the level of a constructive use, as the Airport has been in operation for over two decades, and the BLM modified its RMP in 2008 (and acknowledges the presence of the Airport). Thus, the exposure to aircraft noise has continued for that period and the 2008 Approved RMP does not indicate concerns with noise from Cal Black Memorial Airport.

Finally, FAA gave some initial consideration to steps to reduce aircraft noise affecting these resources. However, if steps were taken to reduce noise affecting NPS lands, even more increases would occur over BLM lands. Similarly, if steps were taken to reduce effects to BLM recreational lands, the only other lands

that could be overflown would be NPS park lands. Further, FAA could not restrict airspace use to avoid all recreational lands. Therefore, no other prudent and feasible options exist to flight direction.

In preparing a Section 4(f) evaluation, practice calls for the FAA to address 1) the compatibility of the action with the use of the land, 2) prudent and feasible alternatives, and 3) measures that are available to minimize impacts.

3.3.4.2 Compatibility of Cal Black Memorial Airport

Completion of the replacement airport, as discussed above, has reduced the total number of grid points within GCNRA that have experienced noise above ambient levels. However, while in total there has been a decrease in points, there are some points that have experienced an increase in noise. Increased noise exposure has occurred on BLM recreational lands. Therefore, consideration was given to

(1) *Compatibility of the Current Use of the Sites with Aircraft Noise Exposure* - FAA Part 150 Land Use Compatibility Guidelines have been accepted as the guideline for determining the compatibility of various land uses with aircraft noise exposure. As noted, no NPS lands are affected by 65 DNL or greater sound levels reflected in the Part 150 Land Use compatibility guidelines. While the Airport is located on BLM lands, the 1990 Final EIS noted that there were no other prudent and feasible alternatives to the building of Cal Black Memorial Airport on BLM land and further, this land is proposed by the project to be transferred to San Juan County. Additionally, there are very few aircraft operations per day on average to or from Cal Black Memorial Airport. As the 65 DNL contour is expected to remain within airport lands, the FAA considers the site compatible.

    As noted, both NPS and BLM protect the soundscape of and, where applicable, solitude on lands under their control through their resource management plans. Depending upon the visitor's personal interpretation of soundscape, solitude, or natural quiet, portions of NPS and BLM land may not be compatible with the sound level exposure that has been and is expected to be present. However, as noted earlier in the Summary and Conclusion section above, the noise levels affecting overall NPS and BLM lands are not expected to rise to the level of substantial impairment or a constructive use.

(2) *Effects of Noise on Historic Value* – As noted earlier, the operation of flights to/from Cal Black Memorial Airport has not altered the number of grid points that experience (or are expected to experience) a change of exposure above ambient in the NPS Cultural Zone that includes Hole-in-the-Rock Trail within GCNRA. The portion of the trail that is within BLM land has experienced COE of noise (represented by the BLM non-WSA wilderness area) above the thresholds evaluated in **Section 3.2 Noise Analysis** for a quiet setting. While the experience of early settlers to the region would not have included seeing aircraft overflight, overflight today is unavoidable. The presence of aircraft does affect the ability to experience the trail. Regardless of whether Cal Black Memorial Airport had been built, aircraft overflights would have occurred, as reflected in the cumulative noise impact evaluation. While aircraft overflight may affect one portion of the historic value, it does not affect the physical location of the trail. FAA believes this noise effect is small and thus has not affected the compatibility of the trail as a recreational use.

3.3.4.3 Feasible and Prudent Alternatives Evaluation

Because this Section 4(f) Evaluation is being conducted in accordance with a Court Remand and the Project (the Cal Black Memorial Airport) was constructed over two decades ago, no development alternatives were considered. The original 1990 EIS addressed alternatives to the construction of a replacement airport for Halls Crossing Airport, and is herein incorporated by reference.

As noted earlier, FAA gave consideration to steps to reduce aircraft noise affecting these Section 4(f) lands. However, if steps were taken to reduce noise affecting NPS lands, even more increases would occur over BLM lands. Similarly, if steps were taken to reduce effects to BLM recreational lands, the only other lands

that could be overflown would be NPS park lands. Further, FAA could not restrict airspace use over all recreational lands. Therefore, no other prudent and feasible options exist to flight direction.

3.3.4.4 Measures Available to Minimize Impacts to Section 4(f) Properties

As noted earlier, the construction of the Cal Black Memorial Airport has resulted in a net reduction in total grid points within NPS parkland that experience an increase in noise and thus are exposed to aircraft noise above ambient. While a limited number of grid points within GCNRA have experienced increased noise because of the replacement airport, a greater number of points (and thus area) have experienced a decrease in noise. Increased noise exposure to BLM lands has occurred with the operation of Cal Black Memorial Airport.

Because of the proximity of the replacement airport (Cal Black Memorial Airport) relative to the GCNRA boundary (the end of the runway is less than 2,000 feet from the property line), it is not possible to avoid overflying the recreation area of NPS or other BLM lands. BLM lands and NPS lands closest to Cal Black Memorial Airport receive the greatest effect from the replacement airport while lands within GCNRA in the vicinity of the old Halls Crossing Airport have experienced the greatest reductions. Because there is a net reduction in area/grid points within NPS parkland that experience noise above ambient due to aircraft noise levels, the project is considered to have minimized effects on those lands.

Therefore, based on the preceding analysis, the FAA has concluded that the construction of the Cal Black Memorial Airport has not had a constructive use effect on Section 4(f) lands and therefore there are no significant impacts in accordance with FAA Order 1050.1E.

TABLE 3-4: Summary of Noise Change of Exposure at NPS Parkland and BLM Lands

	Number of grid points in each zone for the DNL Change of Exposure									
	Existing Conditions					Future 2030				
	Decrease	Increase				Decrease	Increase			
Management Zone	5 DNL	5 DNL	3 DNL	1.5 DNL	Total	5 DNL	5 DNL	3 DNL	1.5 DNL	Total
Cultural	0	0	0	0	0	0	0	0	0	0
Development	2	0	0	0	0	4	0	0	0	0
Lake	8	0	0	0	0	7	0	0	0	0
Natural	6	1	0	0	1	9	1	0	0	1
Recreation/Res	7	2	0	0	2	7	2	0	0	2
Outside Park/BLM Lands	0	29	0	0	29	0	32	0	0	32
WSA	0	2	5	1	8	0	2	0	0	2
SRMA	0	0	0	0	0	0	0	0	0	0
Non-WSA Wilderness	0	14	4	0	18	0	17	0	0	17

Source: Mead & Hunt, 12-18-2013
Note – shaded rows, indicate zones where the Cal Black Memorial Airport has increased noise to the Zone

	Number of grid points in each zone for the Lmax Change of Exposure							
	Existing and Future (2030) Conditions							
	Change of Exposure Decrease				Change of Exposure Increase			
Management Zone	Total Points	>=10 dBA	5-9.9 dBA	3-4.9 dBA	+3-4.9 dBA	+5-9.9 dBA	+>=10 dBA	Total Points
Cultural	0	0	0	0	0	0	0	0
Development	2	1	2	0	0	0	0	0
Lake	10	1	6	3	0	1	16	17
Natural	81	8	59	24	20	26	25	71
Recreation/Res	21	6	5	10	7	19	28	54
Outside Park/BLM lands	35	4	11	20	43	95	149	287
WSA	0	0	0	0	60	8	5	73
SRMA	0	0	0	0	0	0	0	0
Non-WSA Wilderness	25	4	9	12	97	62	99	258

Source: Mead & Hunt, 12-18-2013
Note – shaded rows, indicate zones where the Cal Black Memorial Airport has increased noise to the Zone

	Existing Conditions – Number of points						Future Conditions (2030)- Number of Points					
	LEQ Change of Exposure		TAA Change of Exposure		NAA Change of Exposure		LEQ Change of Exposure		TAA Change of Exposure		NAA Change of Exposure	
Management Zone	-5 Leq	+5 Leq	-5 minutes TAA	+5 minutes TAA	-2 events NAA	+2 events NAA	-5 Leq	+5 Leq	-5 minutes TAA	+5 minutes TAA	-2 events NAA	+2 events NAA
Cultural	0	0	0	0	0	0	0	0	0	0	0	0
Development	4	0	5	0	6	0	4	0	7	0	7	0
Lake	7	0	17	0	47	0	7	0	23	0	24	0
Natural	9	1	9	3	5	0	9	1	16	3	15	0
Recreation/Res	7	2	20	3	12	0	7	2	25	3	31	1
Outside Park/BLM lands	0	36	0	33	2	3	2	50	5	45	5	33
WSA	0	2	0	3	0	0	0	3	0	6	0	7
SRMA	0	0	0	0	0	0	0	0	0	0	0	0
Non-WSA Wilderness	0	21	0	16	0	0	2	32	0	26	0	15

Leq= Equivalent Sound Level, TAA=Time Above, NAA=Number of Events Above
Note – shaded rows, indicate zones where the Cal Black Memorial Airport has increased noise to the Zone
Source: Mead & Hunt, 12-18-2013

TABLE 3-5: Summary of Noise Change of Exposure at NPS Parkland and BLM Lands – *Cumulative Overflights*

	Number of grid points in each zone for the DNL Change of Exposure									
	Existing Conditions					Future 2030				
	Decrease	Increase				Decrease	Increase			
Management Zone	5 DNL	5 DNL	3 DNL	1.5 DNL	Total	5 DNL	5 DNL	3 DNL	1.5 DNL	Total
Cultural	0	0	0	0	0	0	0	0	0	0
Development	2	0	0	0	0	1	0	0	0	0
Lake	1	0	0	0	0	1	0	0	0	0
Natural	0	0	0	0	0	0	0	0	0	0
Recreation/Res	2	1	0	0	1	2	1	0	0	1
Outside Park/BLM lands	0	4	0	0	4	0	5	0	0	5
WSA	0	0	0	0	0	0	0	1	1	2
SRMA	0	0	0	0	0	0	0	0	0	0
Non-WSA Wilderness	0	1	0	0	1	0	1	2	5	8

Source: Mead & Hunt, 12-18-2013
Note – shaded rows, indicate zones where the Cal Black Memorial Airport has increased noise to the Zone

	Number of grid points in each zone for the Lmax Change of Exposure							
	Existing and Future (2030) Conditions							
	Change of Exposure Decrease				Change of Exposure Increase			
Management Zone	Total Points	>=10 dBA	5-9.9 dBA	3-4.9 dBA	+3-4.9 dBA	+5-9.9 dBA	+>=10 dBA	Total Points
Cultural	0	0	0	0	0	0	0	0
Development	3	1	2	0	0	0	0	0
Lake	10	1	6	3	1	3	8	12
Natural	91	8	59	24	6	21	18	45
Recreation/Res	21	6	5	10	0	4	20	24
Outside Park/BLM lands	29	4	8	17	43	75	101	219
WSA	3	0	0	3	61	7	5	73
SRMA	0	0	0	0	00	0	0	0
Non-WSA Wilderness	17	4	6	7	146	57	72	275

Source: Mead & Hunt, 12-18-2013
Note – shaded rows, indicate zones where the Cal Black Memorial Airport has increased noise to the Zone

TABLE 3-5 (Continued): Summary of Noise Change of Exposure at NPS Parkland and BLM Lands – *Cumulative Overflights*

	Existing Conditions – Number of points						Future Conditions (2030)- Number of Points					
	LEQ Change of Exposure		TAA Change of Exposure		NAA Change of Exposure		LEQ Change of Exposure		TAA Change of Exposure		NAA Change of Exposure	
Management Zone	-5 Leq	+5 Leq	-5 minutes TAA	+5 minutes TAA	-2 events NAA	+2 events NAA	-5 Leq	+5 Leq	-5 minutes TAA	+5 minutes TAA	-2 events NAA	+2 events NAA
Cultural		0	0	0	0	0	0	0	0	0	0	0
Development	2	0	5	0	6	0	2	0	7	0	7	0
Lake	3	0	17	0	19	0	3	0	23	0	24	0
Natural	0	0	9	3	5	0	0	0	17	3	15	0
Recreation/Res	3	1	21	3	12	0	3	1	25	3	31	1
Outside Park/BLM lands	0	12	0	33	2	3	0	12	5	46	5	33
WSA	0	1	0	3	0	0	0	1	0	6	0	7
SRMA	0	0	0	0	0	0	0	0	0	0	0	0
Non-WSA Wilderness	0	3	0	16	0	0	0	3	0	26	0	15

Leq= Equivalent Sound Level, TAA=Time Above, NAA=Number of Events Above
Note – shaded rows, indicate zones where the Cal Black Memorial Airport has increased noise to the Zone
Source: Mead & Hunt, 12-18-2013

3.4 Cumulative Effects Analysis

3.4.1 Project Effects Overview

In response to the 1993 court decision, potential noise impacts and Section 4(f) impacts were re-analyzed. These analyses show that Cal Black Memorial Airport (the project assessed in the 1990 Final EIS) does not contribute to significant impacts; rather the noise analysis and Section 4(f) evaluation show that the new Airport has overall lessened the total effects on Glen Canyon National Recreation Area (GCNRA), although some new areas have received an increase in noise. Based on that analysis, and consideration of past, present, and future plans in the parks and adjacent BLM lands, this cumulative impact evaluation was performed relative to the changed noise conditions.

3.4.2 Cumulative Effects Analysis

Similar to the updated noise and Section 4(f) analyses, an updated cumulative effects analysis for this Draft Supplemental EIS was prepared to discuss potential cumulative effects from the operation of Cal Black Memorial Airport when considering the past, present, and future conditions. The federal actions associated with Cal Black Memorial Airport present a unique situation. Cumulative effects, per the Council of Environmental Quality guidelines, are to be assessed in the context of the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Because the Airport has already been constructed, and has been in use for over two decades, its effects are readily identifiable and understood as are the nearby actions that have occurred.

In analyzing noise impacts, the cumulative impacts of aircraft overflight of GCNRA on noise conditions are discussed in **Section 3.2**, *Noise Analysis* (representing aircraft operating at the airports evaluated, as well as aircraft that overfly the area to and from other airports – called enroute operations). The cumulative impact evaluation from the local airports and enroute operations concluded that there would be no significant impacts related to cumulative noise resulting from the operation of Cal Black Memorial Airport. In the following section, this cumulative aviation noise condition was then evaluated with other activities in the area that might affect noise from other sources.

The cumulative effects analysis assesses potential cumulative effects resulting from the continued operation of Cal Black Memorial Airport in association with other past, ongoing, and reasonably foreseeable projects in the area. The geographic resource boundary to be used for the cumulative effects analysis is based on the resources identified in the court decision (noise and visitor experiences) and the potential impacts to these resources. Therefore, the geographic resource boundary used is the GCNRA and adjacent BLM properties. Ten past, present, or reasonably foreseeable projects (all located within GCNRA) were identified for the analysis.[51] All ten projects are sponsored by NPS. Below are descriptions of these ten projects, a brief summary of their potential effects on visitor experience and noise, and their potential for contributing to cumulative effects in combination with Cal Black Memorial Airport.

3.4.2.1 Past, Ongoing, and Reasonably Foreseeable Future Projects

Past Projects

Glen Canyon National Recreation Area Uplake Development Concept Plan (DCP)/Environmental Assessment (EA)
The National Park Service uses development concept plans (DCPs) to define the facilities and activities necessary to meet the general goals and objectives set forth in NPS General Management Plan. This DCP, conducted in 2006, provided guidance for development for approximately 15 to 20 years for a project area

[51] U.S. Department of the Interior, National Park Service, *Glen Canyon National Recreation Area – Current Projects*, accessed 2013, http://parkplanning.nps.gov/parkHome.cfm?parkID=62&CFID=3416867&CFTOKEN=16540391&jsessionid=8630e64cf2deffcbd5474b6dc1e5d6ed2c5c.

that covered three marinas within GCNRA: Bullfrog, Halls Crossing, and Hite. Collectively, these areas are referred to as the uplake area. Two of these marinas (Bullfrog and Halls Crossing) are located within the IAI.

This environmental assessment evaluated three alternatives for future development in the uplake areas. The preferred alternative comprised changes to facilities in the form of facility upgrades, expansion, or improvements generally keeping with approved plans and anticipated future needs including increases to employee, concessioner, and visitor services, and paving launch ramps. The preferred alternative also included the reorganization and relocation of some marina services among the three marinas.

According to the environmental analysis, visitor experience would be negatively affected during construction; however it would benefit long-term from improvements associated with the preferred alternative. Short-term impacts to soundscapes would be anticipated as a result from construction activities. Long-term impacts to soundscapes would result from changes in human-caused sound (i.e., watercraft, automobiles, aircraft and electronic devices) due to expansion of visitor accommodations in the form of campsites, family rental units, and lodge space. (Note that the Bullfrog, Halls Crossing, and Hite developed areas are located in the development management zone;[52] noise from human-caused sound is consistent with the purpose and management direction of this management zone.) These improvements would have the potential to increase impacts to the natural soundscape as a result of increased visitation at the developed areas. Visitor noise would vary seasonally and would only be expected to result in minor increases over the existing noise levels during the busy summer months.

Visitor experience would ultimately benefit in the long-term as a result of the DCP project improvements. Overall cumulative impacts to soundscapes would be short-term and would vary seasonally and with construction activities. Neither short-term nor long-term noise impacts to soundscapes would be significant, individually or cumulatively. Therefore, no adverse cumulative impacts would be anticipated to result from this project in combination with the operation of Cal Black Memorial Airport.

EA for Hidden Slough Pilot Site

The purpose of this NPS EA[53] was to examine the environmental impacts associated with the design and implementation of re-vegetation activities at the Hidden Slough site, which is the pilot site for the Colorado River Riparian Re-vegetation Plan. The Hidden Slough site is located on the right bank of the Colorado River, 6.5 miles upstream from Lees Ferry.

The project area already contains man-made noises including motorized watercraft, the congregation of large tour groups, and occasional overhead aircraft. According to the EA, the project was not expected to appreciably increase noise levels above background levels in the long-term, but would produce temporary increases in noise for short durations during construction-related activities. Because noise effects were minor and would not result in any unacceptable impacts, this topic was dismissed from further analysis in the EA. Per the EA, the site of this project is only rarely visited by individual recreationalists and use is confined to daylight hours. However, for those users that do visit the area, the project was predicted to have a minor long-term impact on visitor use and experiences due to the removal of the tamarisk and planting of native vegetation. As the project would have no more than a minor impact to visitors using the area (due to the visibility of plant re-growth), the topic was not further analyzed in the EA.

[52] *NPS Glen Canyon National Recreation Area Proposed General Management Plan, Wilderness Recommendation, Road Study Alternatives Final Environmental Impact Statement* (1979).

[53] A FONSI was issued for the Hidden Slough Revegetation Plan by NPS in November 2008, and the project was completed soon after.

This project is located outside of the IAI, approximately 67 miles from Cal Black Memorial Airport. Noise and visitor experience associated with the re-vegetation process did not result in adverse effects outside the IAI. Further, the distance from the site to the IAI (about 44 miles) prevented any project effects from combining with effects from Cal Black Memorial Airport to produce significant cumulative aircraft noise effects to GCNRA or adjacent BLM lands.

Deepen Castle Rock Cut EA
Castle Rock Cut, located in a natural saddle between Castle Rock and Antelope Island in Lake Powell, has been used in the past as a boat passage from Wahweap Bay to Warm Creek Bay and uplake areas. However, due to current drought and low lake levels, Castle Rock Cut has been closed. The closure has required boaters to take detours that require longer ground travel times, additional user costs, and reduced safety. The purpose of the project, to deepen Castle Rock Cut to 3,580 feet, would enable NPS to re-instigate its use as a boat passage. The NPS issued a FONSI in November 2008; excavation associated with the project began in January 2014 and was completed in April 2014

Construction noise associated with the project resulted in temporary noise increases in the project area. However, this project resulted in a beneficial long-term impact on both the soundscape and visitor experiences by allowing greater dispersal of boats across the lake, which results in less concentrated noise. Construction-related noise from this project was not audible in the IAI, as it is located approximately 37 miles from the edge of the IAI. Because this project benefit visitor experience and noise conditions in the long-term, it did not contribute to cumulative adverse effects to GCNRA or adjacent BLM lands.

Ongoing Projects

Grand Canyon National Park and Glen Canyon National Recreation Area Comprehensive Fisheries Management Plan Environmental Assessment (EA)
Focusing on all waters between Glen Canyon Dam and Lake Mead, the intent of the NPS Comprehensive Fish Management Plan EA is to maintain a thriving native fish community within Grand Canyon National Park and a highly valued recreational trout fishery in the Glen Canyon Reach within GCNRA. The purpose of the project is to develop a programmatic framework for meeting fisheries management goals and objectives in the Colorado River and its tributaries. NPS issued a Finding of No Significant Impact (FONSI) in December 2013 and the project is expected to be implemented over the next 20 years.

This EA noted that the project would result in noise-creating activities for a small number of days (e.g., 20-40 nights electro-fishing), but overall, natural sounds would predominate throughout the project area. Further, the project would benefit visitor experience because it would result in adequate control of non-native fish, consequently, enhancing the park's natural resources. This project would not result in adverse effects to either noise resources or visitor experience. Therefore, potential environmental effects of this proposed project, in combination with effects associated with Cal Black Memorial Airport, would not result in cumulative effects to GCNRA or adjacent BLM lands.

Off-Road Vehicle (ORV) Management Plan at Glen Canyon National Recreation Area
The NPS ORV Management Plan/Draft EIS (ORV Draft EIS) (January 2014) was prepared to evaluate "off-road use by conventional and non-conventional motor vehicles and on-road use by nonconventional motor vehicles" and to develop management actions that preserve Glen Canyon's scientific, scenic, and historic features; provide for the recreational use and enjoyment of the area; and promote the resources and values for which the area was established as a unit of the national park system.[54] The ORV Draft EIS evaluates five alternatives for managing off-road use and on-road use of off-highway vehicles (OHVs) and street-legal all-terrain vehicles (ATVs) and assesses the impacts that could result from continuing current management (the no-action alternative) or implementation of any of the action alternatives. The Preferred Alternative designates a mixture of opportunities for motorized recreation on park roads and designated ORV routes and at remote shoreline areas while prohibiting such uses in areas where resources and values may be at risk.

[54] U.S. Department of the Interior, National Park Service, *Off-Road Vehicle Management Plan Draft Environmental Impact Statement for Glen Canyon National Recreation Area,* (Page, Arizona, January 2014), page ii.

Based on the ORV Draft EIS, there will be added noise from ORV sources which could impact areas within the IAI used in this Draft Supplemental EIS. Impacted areas (i.e., along unpaved GMP roads) "could potentially experience a 3 dBA increase in natural ambient level due to motorized vehicle operations." [55] During times when no motorized vehicles are operating in a particular area, no impacts would occur. In its cumulative analysis, NPS found that "… potentially adverse impacts on soundscapes from aircraft overflights, watercraft, and motorized vehicle use on roads and off-road within Glen Canyon and on adjacent federal lands would result in long-term adverse cumulative impacts when combined with the adverse… impacts of [the preferred alternative]."[56]

A combination of noise effects resulting from ORVs and overflights from Cal Black Memorial Airport could result in cumulative effects. However, there are currently no mitigation measures within the FAA's control that are available to reduce these effects or to avoid adverse cumulative effects from aircraft overflight and ORV use.

Lee's Ferry Road Rehabilitation and Paria River Stabilization EA
This project proposes to restore, rehabilitate, and repave the 6-mile-long Lees Ferry Road near the confluence of the Paria River and Colorado River in Arizona. The EA was issued by NPS in July 2012, and the agency issued a FONSI in October 2012.

During construction, human-caused sounds would likely increase because of equipment, vehicular traffic, and construction crews. However, long-term effects on noise are not anticipated. Visitor use would be affected in the short-term during construction; however, the project would not affect visitor experiences in the long term. Because this project is located in Arizona, outside of the IAI by a distance of about 46 miles, the distance prevents any project effects from combining with effects from Cal Black Memorial Airport to produce significant cumulative effects to GCNRA or adjacent BLM lands.

Air Tours
Air tours over GCNRA and other nearby parks are a past, present, and expected future occurrence. As noted in Section 2.6.1.4, approximately 53% of aircraft-related noise complaints in the past were associated with air tours. The development of Cal Black Memorial Airport has not appeared to have affected the number of tours, as such tours are initiated for other nearby airports, such as Page, Arizona. In 2006, the GAO noted that authority to conduct air tours enabled a total of 14,074 overflights of GCNRA by 15 operators. As of 2013, operators were allowed to fly a maximum of 8,222 air tours per year over GCNRA;[57] however, according to the FAA Annual Report, only 4,437 air tour operations over GCNRA were reported in 2013;[58] (12 flights a day).[59] Noise from air tours, combine with noise associated with the aircraft operating at Cal Black Memorial Airport as well as with the enroute and transient overflights. In the noise analysis (**see Appendix H**, *Noise Study)*, the number of enroute overflights flying over the study area was assumed to be 450 flights per day for existing conditions. Data is not available to quantify the cumulative exposure from air tours. During the collection of actual sound level measurements conducted for this study, air tours were not observed. Thus data is not available concerning the incremental increase in sound exposure associated with air tours. While visitor annoyance, as expressed by the noise complaints will likely continue due to air tours being audible, FAA believes these effects are limited in numbers and duration in the project

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55 U.S. Department of the Interior, National Park Service, *Off-Road Vehicle Management Plan Draft Environmental Impact Statement for Glen Canyon National Recreation Area,* (Page, Arizona, January 2014), page 333.

56 U.S. Department of the Interior, National Park Service, *Off-Road Vehicle Management Plan Draft Environmental Impact Statement for Glen Canyon National Recreation Area,* (Page, Arizona, January 2014), page 334.

57 U.S. Department of Transportation, Federal Aviation Administration, *National Parks Air Tour Management Program Glen Canyon National Recreation Area and Rainbow Bridge National Monument Voluntary Agreement Kick-Off Meeting, General Route Patterns* (PowerPoint presented on September 11, 2013).

58 U.S. Department of Transportation, Federal Aviation Administration, *Reporting Information for Commercial Air Tour Operations over National Park Units, 2013 Annual Report* (April 29, 2014). http://www.faa.gov/about/office_org/headquarters_offices/arc/programs/air_tour_management_plan/documents/FAA-NPS-2013-Report.pdf

59 U.S. Department of Transportation, Federal Aviation Administration, *Reporting Information for Commercial Air Tour Operations over National Park Units, 2013 Annual Report* (April 29, 2014).

study area. As air tour noise contribution would be the same under the No Action and the With Project, a qualitative consideration was given to the effects of such activity relative to the noise discussed in Chapter 3.2 *Noise*. As is indicated, completion of the Cal Black Memorial Airport has generally reduced aircraft noise over GCNRA; while fewer grid points in GCNRA experience noise above ambient with Cal Black Memorial Airport, some grid points have experienced an increase. The noise from Cal Black Memorial Airport at those locations could increase further with the conduct of air tours. However, FAA has no information indicating that such cumulative impacts are or would be significant.

Primarily because of concern that noise from air tours over national park units could impair visitors' experiences and natural, cultural, and historic resources, Congress passed National Parks Air Tour Management Act of 2000 (P.L. 106-181, Title VIII, hereinafter "Air Tour Act"). This law regulates commercial air tours at park units and requires the FAA and NPS to create management plans for air tours at individual park units and within a half-mile of their boundaries. Each plan could prohibit or limit air tours, such as by route and altitude restrictions The Air Tour Act final rule requires air tour operators to apply for authority to fly over national parks and abutting tribal lands. FAA received applications for commercial air tours over 106 of the 385 park units, and has granted interim operating authority to all applicants. Application for air tours triggers development of an Air Tour Management Plan (ATMP) by FAA and NPS for each unit where none exists, except for a few exempted sites; GCNRA is not exempt. The purpose of a plan is to mitigate or prevent any harm by commercial air tours to natural and cultural resources, visitor experiences, and tribal lands. Development of an ATMP requires an environmental review under the NEPA. The FAA and NPS are developing ATMPs at 13 locations, but none have been completed to date. According to the FAA's web site, GCNRA is not a park unit where an ATMP is currently under development.

Reasonably Foreseeable Future Projects

Glen Canyon Rim Trail EA
This project, sponsored by NPS, is to construct an 8.7 mile recreational use trail along the common boundary of Glen Canyon National Recreation Area and the City of Page about 38 miles from the edge of the IAI. The trail will be a non-motorized trail for pedestrian and bicycling use. The NPS issued a FONSI in August 2009, however the project has not yet been implemented due to funding constraints.

The project area is currently subject to human-caused sounds, primarily due to motorized vehicle traffic on U.S. Highway 89 and municipal roads. Because human sounds are not unexpected or necessarily inappropriate within the Glen Canyon Rim Trail project area, NPS designed implementation of the project to avoid impacts to the soundscape. Further, construction of a new recreational trail would result in a beneficial impact to visitor experience. This project is not anticipated to result in an adverse effect to either noise or visitor experience. Further, its combination with effects from Cal Black Memorial Airport would not result in cumulative effects to GCNRA or adjacent BLM lands.

Long-Term Experimental and Management Plan (LTEMP) for Glen Canyon Dam
The purpose of NPS's proposed Long-Term Experimental and Management Plan (LTEMP) is to use current and develop additional scientific information to better inform that agency's decisions in operating the dam. NPS's goal is to provide a management plan that will help to improve and protect important downstream resources while maintaining compliance with relevant laws. The LTEMP is intended to develop and implement a structured, long-term experimental and management plan to determine the need for potential future modifications to Glen Canyon Dam. Note that this project area, the Glen Canyon Dam, is located approximately 38 miles outside of the IAI.

While the Environmental Impact Statement for the LTEMP has not yet been issued, the evaluation of dam operations is not anticipated to result in long-term effects to noise or visitor experience. Because this project would not affect noise or visitor experience, it would not have the potential to combine with effects from Cal Black Memorial Airport.

Oral Rabies Vaccination Program EA
This project proposes to implement an oral rabies vaccination (ORVAC) program at several park units with lands in Arizona and New Mexico, including in GCNRA. The program's objective is to stop the spread of a specific gray fox variant or "strain" of the rabies virus which has occurred west of the original gray fox ORVAC zone in Texas toward the New Mexico border and an ongoing outbreak of gray fox variant rabies in western New Mexico and eastern Arizona. Additionally, the program would seek to control the recent spillover of big brown bat variant rabies into gray fox in and around Flagstaff, AZ.

The NPS has not issued a Draft EA for this project, but neither noise nor visitor experiences are anticipated to be adversely affected. Because this project would not affect noise or visitor experience, it would not have the potential to combine with effects from Cal Black Memorial Airport.

Bullfrog Campground and Storm Water Drainage Improvements EA
The purpose of this project would be to improve water drainage in the Bullfrog developed area of GCNRA. Storm water run-off currently deposits sand and debris as it moves through the campground and other areas. This causes damage to infrastructure, increased maintenance, and visitor and employee safety concerns. Improvements to surface water flow are needed to address current storm water run-off issues, to prevent damage to existing infrastructure and to maintain visitor and employee safety. Surface flow improvements may include redirecting or modifying existing drainage systems around the developed area in a way that does not put people or park resources at risk. Construction activities would require excavation to alter existing drainage channels and may result in redirecting where storm waters are delivered prior to reaching Lake Powell.

This project is located inside of the IAI. While the EA for this project has not yet been issued by NPS, the project is expected to have a beneficial effect on visitor experience, and would not adversely impact noise. Based on information provided by the NPS, there would be short-term noise impacts during project implementation (if approved), but these noise impacts would not be significant individually nor cumulatively. Thus, no adverse cumulative impacts would be expected from this project in combination with the operation of Cal Black Memorial Airport.

Rainbow Bridge Trail Improvement Plan EA
This plan would provide needed support for the ongoing maintenance, rehabilitation, and improvement of the existing trails within Rainbow Bridge National Monument, which is located approximately 11 miles southwest of the IAI, adjacent to the Navajo Nation. This project is not expected to result in noise impacts, and will beneficially affect visitor experience.

The project is designed to improve the visitor experience. While this EA has not yet been issued by NPS, there are no adverse noise impacts anticipated. Based on information provided by the NPS, there would be short-term noise impacts during project implementation (if approved), but these noise impacts would not be significant individually nor cumulatively. Thus, no adverse cumulative impacts would be expected from this project in combination with the operation of Cal Black Memorial Airport.

Rehabilitate Wahweap Access Roads/Lakeshore Drive
This project proposes to rehabilitate, restore, and resurface approximately five miles of Lakeshore Drive, two miles of Wahweap Boulevard, and 0.3 miles of Wahweap Marina Drive in GCNRA. This project is located just north of Glen Canyon Dam near Page, Arizona.

The project would include replacement of damaged concrete and asphalt curb, installation of concrete curb in new locations to address roadway drainage issues, drainage structure improvements, drainage improvements of existing ditches, pullout improvements, removal of existing guardrail, installation of new guardrail, and other safety improvements. An EA will be issued by NPS, and project implementation is planned for winter and spring of 2015/2016.

This project is located outside of the IAI, approximately 38 miles from the IAI. While there would be short-term noise impacts during project implementation (if approved), the distance from the site to the IAI would prevent any project effects from combining with effects from Cal Black Memorial Airport to produce significant cumulative aircraft noise effects to GCNRA or adjacent BLM lands.

3.4.3 Climate

Of growing concern is the impact of proposed projects on climate change. Greenhouse gases are those that trap heat in the earth's atmosphere. Both naturally occurring and anthropogenic (man-made) greenhouse gases include carbon dioxide (CO_2),[60] methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HCFs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6).[61]

Although there are no Federal standards for aviation-related greenhouse gas emissions, it is well-established that greenhouse gas emissions can affect climate. The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses. As noted by CEQ, however, "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand."[62]

With respect to greenhouse gas emissions, aviation activity at the Airport represents a small percentage of U.S. and global emissions. In 2010, the US aviation system served 51,255,000 operations, which are expected to increase to 59,480,600.[63] Cal Black Memorial activity (forecast at 1,703 operations in 2030; see Table 1-2) would represent 0.003% of US activity in 2030.[64]

3.4.4 Cumulative Effects Analysis Conclusions

Of the ten past, present, and reasonably foreseeable future projects included in the cumulative effects analysis, all but two are located outside of the IAI. However, all projects were included because they are located in the geographic resource boundary that was used for the cumulative effects analysis (GCNRA and adjacent BLM properties). Impacts from Cal Black Memorial Airport, when added to these past, present and reasonably foreseeable future projects located outside of the IAI, would not result in cumulative effects.

The Bullfrog Campground and Storm Water Drainage Improvements project and the Off-Road Vehicle Management Plan both include activities within the IAI. Because the improvements to the Bullfrog developed area are expected to have a beneficial effect on visitor experience, and would not adversely impact noise, it is not anticipated that this project, in combination with the operation of Cal Black Memorial Airport, would have a cumulative effect on GCNRA and adjacent BLM lands. However, adverse cumulative effects are anticipated from a combination of the ORV Management Plan effects and the operation of Cal Black Memorial Airport.

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60 All greenhouse gas inventories measure carbon dioxide emissions, but beyond carbon dioxide different inventories include different greenhouse gases (GHGs).

61 Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also greenhouse gases, but they are, for the most part, solely a product of industrial activities. For example, chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) are halocarbons that contain chlorine, while halocarbons that contain bromine are referred to as bromofluorocarbons (i.e., halons) or sulfur (sulfur hexafluoride: SF6)

62 "Memorandum for Heads of Federal Departments and Agencies, Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions" dated February 18, 2010, page 3

63 https://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts/2014-2034/media/Forecast_Tables1-34.pdf; see Table 32. *FAA Aerospace Forecast: Fiscal Years 2014-2034*

64 https://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts/2014-2034/media/Forecast_Tables1-34.pdf; see table 32. *FAA Aerospace Forecast: Fiscal Years 2014-2034*

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